MICROpendium

Covering The TI99/4A Home Computer And Compatibles

Volume 3 Number 6 **July 1986** **$1.50 per copy**

INSIDE

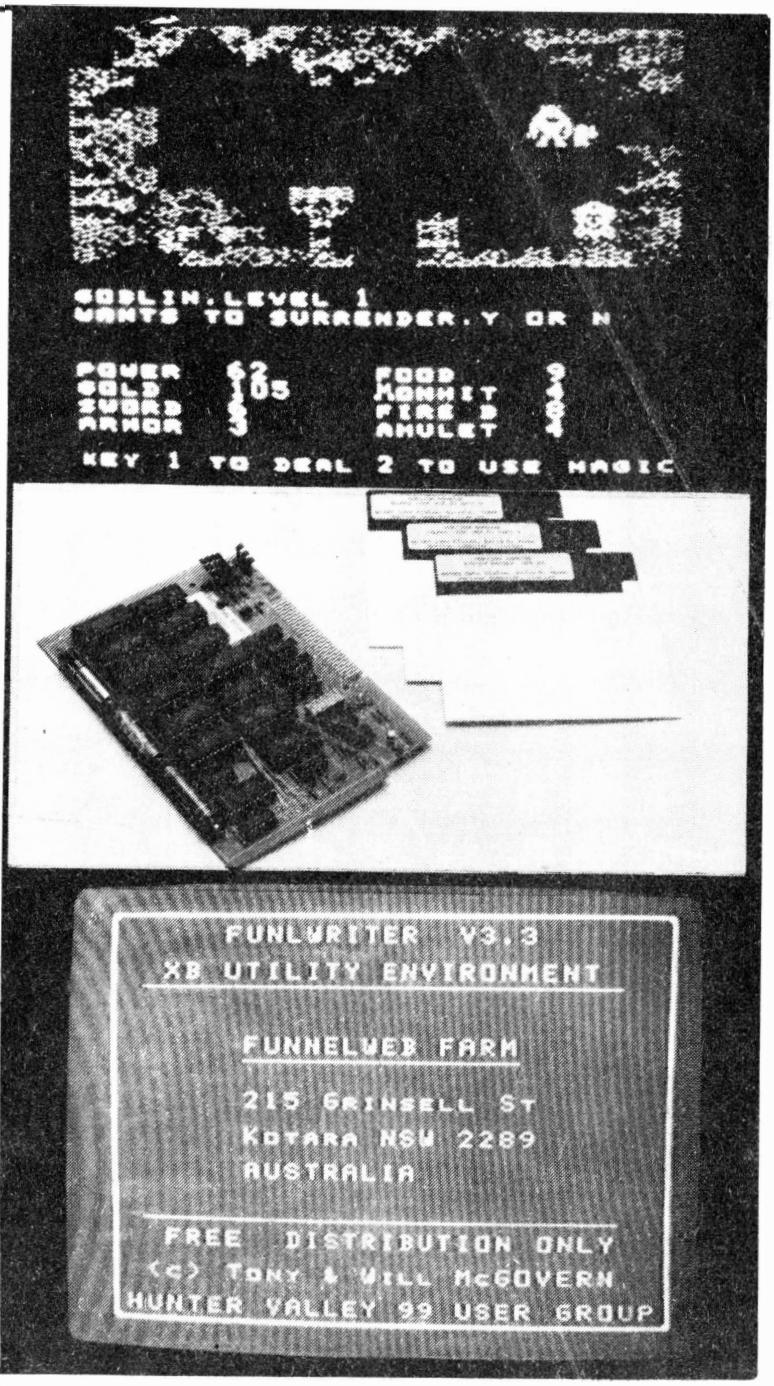
Using VPEEK to unlock VDP memory

More on Geneve

Forthfont concluded

Reviews:

Horizon RAMdisk
Old Dark Caves
Funlwriter
Macro Assembler



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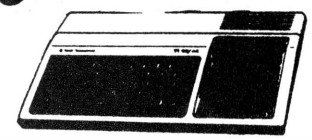

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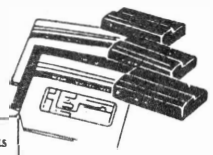

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Coming next month

—GPL primer
—Joypaint reviewed
—Cryptography and the TI99/4A

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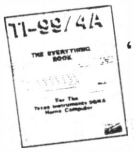

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Comments

Running out of back issues

We're beginning to run out of back issues. New subscribers have nearly depleted our stock of Vol. 1 No. 2—fewer than 20 remain. And our inventory of Vol. 1 No. 1 is down to less than 50. (We will automatically issue refunds to anyone who orders out-of- stock editions.) In the future, the order form on the back page will indicate which editions are sold out. (Please do not try to reserve copies by phone. All orders are filled on a first-come, first-serve basis.)

We're glad to report that Mack McCormick is back on line. He recently got married, so things have no doubt been hectic for him, but we will have his latest comments next month. The subject will be GPL (Graphics Programming Language).

Some of the letters we get from readers have to do with problems encountered with vendors. Principal subjects among these range from complaints about defective products to apparently deceptive trade practices. We don't generally publish these letters because it is difficult to determine what the true facts are. However, some of the letter writers seem to suggest that only vendors who market to the TI community are subject to these problems.

Actually, my experience in the TI market has been much better on average than with the PC market. I do consulting and other computer-related activities in the publishing world and I will categorically state that defective products are common, particularly with third-party products. I purchased a system for a client recently that included a well-known, lower-priced modem card. It took two months and four cards to finally obtain one that actually worked. I designed a system last year consisting of eight networked PC clones, of which three had defective CPUs.

Quality control has long been in an issue in the personal computer marketplace and remains so. Not even IBM has been able to overcome this problem. The point is that the home computer and personal computer markets share many of the same problems and that realistically the problems will remain as long as manufacturers are required to sell products at discounted rates. Quality control is a matter of economics. The more money a company spends on quality assurance, the more the user will have to spend for the product. And it has been demonstrated time and again that users would rather save a few bucks than pay for something as intangible as quality.

—JK

Reviewed in MICROpendium

1984

February: B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500

March: Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Prowriter 8510 Printer

April: Monthly Budget$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh

May: Companion Word Processor, Q*Bert, Mad-Dog I & II, Programs for the TI Home Computer

June: Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II

July: Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position

August: TE-1200, Tower, Galactic Battle, Galaxy

September: Wycove Forth, 99/4 Auto Spell-Check, QUICK-COPYer, Wizard's Dominion, Anchor Automation Mk XII Modem

October: Killer Caterpillar, ZORK I, Defender

November: 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X

December: Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

January: Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner

February: Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II

March: Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor

April: 9900 Micro Expansion System, Disk + Aid, Gemini 10X-15X

May: Character Sets and Graphics Design, Draw 'N Plot

June: GRAPHX, DATA BASE I

July: Acorn 99, Advanced Diagnostics

August: Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll

September: Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion

October: 4A/TALK, Extended BASIC II Plus, XB Detective, Console Writer 2.1

November: Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor

December: Display Enhancement Package, Triple Tech

1986

January: BITMAC, Starcross

February: Night Mission, Peripheral Diagnostic Module, BA-Writer

March: Super Duper, Tunnels of Doom Editor, Business Graphs 99

April: U.S. Open Tennis, PRBASE

May: 4A Flyer, GRAM Kracker, Artist's Companion

June: Myarc Disk Controller Card, Maximem

Module Emulator

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Feedback

Where to find Z80 aid

I respond to Al Osorio on the Z80 Card. I have made everything work except for the printer and have found out information about CPM through CP/M user groups like Kaypro and CPM magazines and books.

Also, a while back someone wrote something about CorComp Disk Controller showing a lot of "No disk in drive," etc. Well, I called CorComp and they told me which chip and one resistor to replace and it did it no more.

Ernest Feil
Petaluma, California

Cooling it down

Like many other users of the TI99/4A, I recently purchased the Mechatronic Extended BASIC II Plus. One of the first things that I noticed was that the chips used in the module caused both the module and the computer to run very warm!

In some spots on the computer the temperature was actually over 105 degrees Fahrenheit. Although the computer and module functioned flawlessly, I was always concerned about the amount of heat build-up on these two components.

Action was needed. So, I bought a three-inch muffin fan from Radio Shack. Then by using some double-faced tape, making tape, and a piece of screen I constructed a ventilation tower over the ventilation slots located in the upper right-hand section of the console. The whole thing cost less than $20 and the console and module run very cool now. This will no doubt prolong the useful life of both of these items.

Eric W. Bray, M.D.
Philadelphia, Pennsylvania

Flight to take off?

Your review of the "4A Flyer" was of extreme interest to me. I also had purchased this product in order to see what the competition was like. My reactions were very similar to John Koloen's. It was a real disappointment as a flight simulator.

Needless to say, I was also pleased to hear his positive remarks about my Dow-4 Gazelle program. (Incidentally, it is *not* written in Extended BASIC, just BASIC.)

However, the real reason I am writing is to describe a program I have been working on for well over a year. I believe it is exactly the type of "sophisticated flight simulator" that John Koloen wrote he hopes for. I have not made any mention of it before in print because I have not yet deemed it to be a marketable product according to my standards, although several people have used it and they seemed to think it was marketable as it is. I have not wanted to be accused of promoting a nonexistent product.

So please hear me correctly—I am not yet in a position to market this simulator, and I cannot guarantee that I will be, for the simple reasons that I have a job and family that are very demanding of my time and energy. I cannot work on it without knowing that there is a definite market. But I am also concerned about stealing (more commonly known as pirating) software. Frankly, why should I spend many hundreds of hours on a product only to have people steal it?

Given that disclaimer, I'll briefly describe what I have. Maybe enough people will express interest to motivate me to finish it.

My assembly language flight simulator requires disk and expansion memory, and loads from Extended BASIC, the Editor/Assembler or the Mini-Memory Module.

Flying it requires both a joystick and the keyboard. The joystick controls pitch and bank. Currently, the rudder is only effective on the ground; in the air, flight is coordinated. The keyboard is used for the following: views (front, right, left, back and leaning forward to get a better view of the ground over the nose); flaps down or up (flaps are electric); open and close throttle; trim down or up (electric like the flaps); trim neutralization (i.e., trim off the pressure); reset the horizon on the artificial horizon; left and right rudder; pause and continue; select frequency and radial on either of the two nav radios. Finally, as with the Dow-4, you can select the effectiveness of the controls (in this case, pitch, bank and rudder).

The bottom 14 rows of the screen show the instrument panel. The only digital displays are the thousands and tens of thousands of feet indicators on the altimeter and the minutes on the clock; the long hand on the altimeter and the sweep second hand on the clock are both needles. Other analog instruments, in standard arrangement, are artificial horizon, airspeed indicator, turn indicator, directional gyro (the letters N, S, E and W revolve around the dial to indicate direction), vertical speed indicator, fuel gauges, the needles on the nav radios, the flap indicator and the trim indicator. In short, the display of the panel both looks and acts very much like the instrument panel in a real airplane.

The top 10 rows of the screen show your view of the horizon and ground. The view covers the entire width of the screen. Objects on the ground include: a river and a lake (both with winding banks), roads, houses and other buildings (with hidden far sides), runways and towers. Included in the vew is a wing tip, the tail, or the nose (if you lean forward), and any of these will obscure any objects on the ground that happen to be behind it.

If you make an instrument approach, you fly down through a cloud layer and of course can see nothing but white through the window at that time. When you break out into the clear, the ceiling is ragged so you should not immediately switch from IFR to VFR flying. It is possible to make ILS and VOR approaches, and you can use the two radios to hold at an intersection or to monitor position as radials are crossed.

(Please turn to Page 10)

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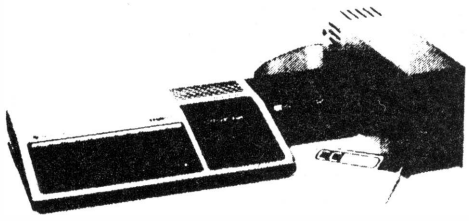

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Feedback

(Continued from Page 8)

The very nice thing about this program is its speed. The entire display is refreshed five to 10 times per second, usually 10 times per second. This is fast enough to appear to be smooth, given the resolution of the screen. This is why you must use a joystick. The program is so fast you could not possibly control it with just the keyboard.

In order to achieve this speed, the display consists only of lines on a monochromatic background. I figured people are more interested in a rapidly updated schematic display rather than a slowly updated pretty display. Speed coupled with realistic flight simulation formulas makes the simulation much more enjoyable in my opinion.

Sound effects include engine noise similar to that of the Dow-4. Also included is the sound of the tires hitting the runway. With a nice landing, you can barely hear them touch down. With a hard landing, you not only hear a much louder sound but you may even bounce and be airborne again, or you can crash. The program is fast enough that you can and should flare to land.

A fun thing to do is to land and come to a stop, then turn 180 degrees on the ground, open up the throttle and take off in the opposite direction.

Things I still need to do are make inverted flight work properly; add more scenery; get the fuel gauges, turbulence and wind to work; and write some documentation.

Finally, I feel there are two features of this simulator that give it a special rating, even compared to simulators on more powerful computers. First, I use a sophisticated mathematical technique to generate the banks of the lake and river. As a result, as you get lower and lower to the ground, you see more and more detail. Thus, even though rivers and roads look similar from a distance, they are clearly distinguishable as you get closer because roads are straight but rivers are all full of unpredictable bends.

Another feature is a scheme whereby no matter how high you fly nor how low, and no matter where you are over the terrain, there are always objects to see on the ground. These objects appear as dots when far away, but grow into larger, colored objects (which you can imagine to be tree tops) when you get closer. Because of these, you always have visual clues as to your altitude and speed. This enables you to fly as close as 20 feet to the ground without hitting it.

There you have a brief description of what currently exists on my computer. Because I have been very busy, I have not been able to touch this for nearly six months now. I would be interested to know how many people would be interested in it, and at what price.

John T. Dow
Pittsburgh, Pennsylvania

Printer compatibility

I recently purchased TI-Artist, Artist Extras and Artist's Companion at the TI Fest-West in Los Angeles. After being thoroughly impressed with the demonstration, I was assured that these programs will work with my printer, namely a Seikosha GP-100TI made by Axiom.

However, after several hundred tries, and weeks of frustration, I couldn't make the programs work with my printer. Therefore, I wrote letters to Texaments and Inscebot Inc. Both firms responded promptly and told me that "...sorry but contrary to what the program states..." the GP-100TI is actually a modified GP-250 printer and blamed the problem on the printer manufacturer. Both firms offered to buy back the disks and refund the money I paid for them.

My questions to all are:

1. Why do software companies claim that a program works with a particular brand—do they test it out?

2. Why did Seikosha (Axiom) pull a switch on the consumer without telling them? As I understand it, there is both a GP-100TI and GP-100TI2. What is the difference?

3. Is it true that Epson is the parent company of Seikosha (Seiko), and why is this printer not Epson compatible?

4. Are there any screen dump programs *anywhere* in this world that will work with the GP-100TI printer?

Arthur Hazboun
Harbor City, California

You ask a lot of questions. A few we can answer.

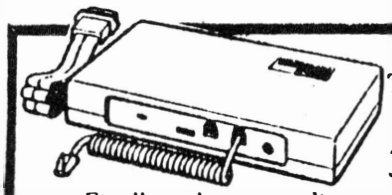
1. Sometimes a software company is able to test its products on a particular printer and know whether it will work. In other cases, a company may "extrapolate" compatibility by examining a printer manual. In other cases, a company simply infers compatibility. That is, if Company X has a printer that is compatible with Brand A computer then all Company X products are compatible. This works sometimes. Others may just guess. There are no standards.

2. A company may not feel an obligation to inform consumers about its marketing. Besides, there is a logistical problem in getting the information out. We have no information about the difference between a GP-100TI and a GP-100TI2.

3. We are not aware of the relationship between Epson and Seikosha. Epson has produced a great many printers for Original Equipment Manufacturers (OEM) that are sold under a variety of brands, including Commodore, TI and others. These OEM machines are often manufactured to the specifications set by these brand name companies. If they do not ask for "Epson compatibility," then the printers may not be Epson compatible despite being built by Epson.

4. There may be. We ask that readers who know of a GP-100TI compatible screen dump provide us with the information.—Ed.

The Feedback column is for readers. It is a forum to communicate with other readers. The editor will condense excessively lengthy submissions where necessary. We ask that writers restrict themselves to one subject for the sake of simplicity. Our only requirement is that items be of interest to persons who use the TI99/4A home computer. Mail Feedback items to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.



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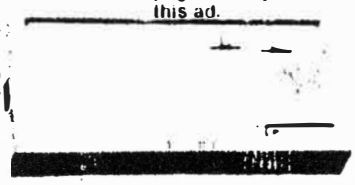

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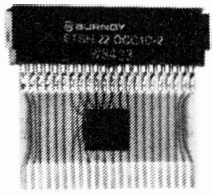

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VPEEK is key to unlocking VDP memory

By J. PETER HODDIE

While I was busy lining up speakers, vendors, "volunteers," and the like for the New England TI Faire back on April 5, I had the pleasure of speaking to many of the true "greats" of the TI world.

Among these were Paul Charlton, Craig Miller, John Clulow, Barry Traver, Lou Phillips and Jim Peterson, to name but a few.

While I was talking to Peterson (you may know him better as Tigercub Software, some of the most original programs for the TI) he mentioned that he was looking for a routine to tell you how the color sets were defined in Extended BASIC. You can find out what the characters are by using the CHARPAT routine, but there is no corresponding routine for determining the colors.

I told Jim, no problem, all you need is a VPEEK (a PEEK routine, that allows you to access VDP [Video Display Processor] memory). Rather than dig through my piles of magazines and disks where I knew there must be one buried, I sat down and wrote one.

Well, I got that written, and, using the VDP memory map for Extended BASIC in the back of Millers Graphics Explorer manual, I located the address of the color table and wrote a short Extended BASIC program to show Jim how to access them.

But while I had that memory map in front of me it became *very* apparent that there were a lot of other really good pieces of data sitting in VDP memory that no one had bothered to explain how to access (at least not from Extended BASIC). So I spent that evening cooking up little demo programs to show how this information could be accessed. This information includes such things as sprite position, color, character and motion; last file accessed; last drive accessed; and name of last disk written to.

Also, because my VPEEK and VPOKE routines use strings to transfer data instead of numeric variables you can easily transfer up to 255 bytes of data in one statement. This lets you do some pretty fancy things with sprites and also lets you do things much faster than you could in BASIC. But rather than explain all this with text I will illustrate with some brief sample programs.

The first program fills Jim's original request. It VPEEKs out the color table and tells you how the colors are defined in Extended BASIC at the moment it is called. It also sets a few colors just to make it more interesting.

```
05 CALL COLOR(1,8,2,2,2,8,10,
2,15,11,16,2)
10 A=8*16^2+16
20 CALL LINK("VPEEK",A,14,A$
)
30 FOR Z=1 TO LEN(A$)
40 C=ASC(SEG$(A$,Z,1))
45 FC=INT(C/16):: BC=C-16*FC
 :: FC=FC+1 :: BC=BC+1
50 PRINT USING 100:Z,FC,BC
60 NEXT Z
100 IMAGE "CALL COLOR(##,##,
##)"
```

The next program does the same thing for sprites that the last one did for colors. It checks out all 28 sprites and gives you the equivalent CALL SPRITE statements for their position and motion at the instant that the call is made. Note that by VPEEKing the data in a string variable instead of into numeric variables in a series of VPEEK calls, the positions of *all* sprites are obtained at the same instant, thus giving more accurate results. The sprite data are read from VDP memory immediately after the screen changes color.

```
5 IMAGE "CALL SPRITE(##,###,
###,###, ###,###,###)"
6 CALL CLEAR :: FOR Z=1 TO 2
8 :: CALL SPRITE(#Z,42,16,10
0,100,(Z-13)*2,(Z-15)*2):: N
EXT Z
10 A1=3*16^2
20 A2=7*16^2+8*16
30 CALL LINK("VPEEK",A1,112,
A$)
40 CALL LINK("VPEEK",A2,128,
B$)
50 FOR Z=1 TO 28
60 S$=SEG$(A$,Z*4-3,4)
70 SV=ASC(S$)+2 :: SH=ASC(SE
G$(S$,2,1))+1
71 IF SV>255 THEN SV=SV-256
80 SCH=ASC(SEG$(S$,3,1))-96
:: SCO=(ASC(SEG$(S$,4,1))AND
 15)+1
100 S$=SEG$(B$,Z*4-3,4)
110 SVV=ASC(S$):: SHV=ASC(SE
G$(S$,2,1))
111 IF SVV>128 THEN SVV=SVV-
256
112 IF SHV>128 THEN SHV=SHV-
256
120 PRINT USING 5:Z,SCH,SCO,
SV,SH,SVV,SHV
150 NEXT Z
```

The next routine sets some sprites in motion, all at *exactly* the same time by VPOKE-ing directly into the sprite motion table (and then adjusting the byte, via a CALL LOAD, in CPU memory location -31878 that contains the maximum number of sprites in motion). Af-

(Please turn to Page 14)

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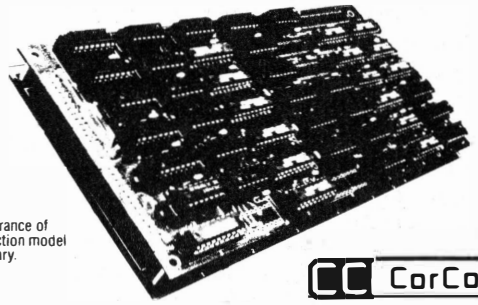

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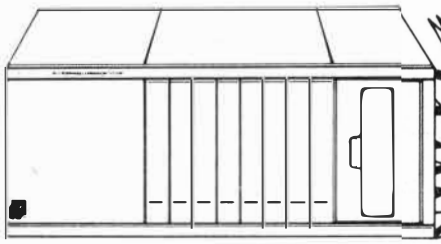

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VDP UTILITIES FOR EXTENDED BASIC—

(Continued from Page 12)

ter a short while a group of five sprites simultaneously swoop straight up out of the moving line and then after a few more seconds all the sprites stop at the same instant. This should give you some idea of the power of this technique, particularly in creating animated effects.

```
5 CALL CLEAR
10 FOR Z=1 TO 10
20 CALL SPRITE(#Z,42,16,Z*8,
Z*8)
30 NEXT Z
40 A=7*16^2+8*16
50 CALL LINK("VPOKE",A,RPT$(
CHR$(10),4*10))
60 CALL MOTION(#11,1,0)!ACTI
VATE SPRITES
70 FOR Z=1 TO 200 :: NEXT Z
80 CALL LINK("VPOKE",A,RPT$(
CHR$(10)&CHR$(0),4*10/2))
90 FOR Z=1 TO 200 :: NEXT Z
100 CALL LINK("VPOKE",A,RPT$
(CHR$(0)&CHR$(220),4*10/2))
110 FOR Z=1 TO 200 :: NEXT Z
120 CALL LINK("VPOKE",A+2*10
/2,RPT$(CHR$(220)&CHR$(0),2*
10/2))
125 FOR Z=1 TO 200 :: NEXT Z
130 DISPLAY AT(10,1):"AND TH
AT IS THAT . . . . .  STRANG
E, NO?"
135 CALL LINK("VPOKE",A,RPT$
(CHR$(0),4*10))
140 GOTO 140
```

This routine displays the name of the last file accessed and the drive number that it was on. It also gives the name of the last disk that was written to. Note that this routine does not behave correctly if the last device accessed was a Myarc RAM disk.

```
10 A=4*16^3-11
20 CALL LINK("VPEEK",A,11,A$
)
30 PRINT "LAST DRIVE ACCESSE
D: "&STR$(ASC(A$))
40 PRINT
50 PRINT "LAST FILE ACCESSED
: "&SEG$(A$,2,10)
60 A=3*16^3+14*16^2+16*15+5
65 CALL LINK("VPEEK",A,10,A$
)
70 PRINT
80 PRINT "NAME OF DISK: "&A$
```

This routine will redefine any character as any other character. Although this could be done in Extended BASIC using the CHARPAT and CHAR routines it is shown here to illustrate the technique. It could be used to redefine whole blocks of characters or to move the entire set of uppercase characters to the lowercase character definitions, thus creating two sets of uppercase characters that could have different colors. This could be accomplished quickly using two long VPEEKs and VPOKEs based on the information in the memory map below.

```
5 PRINT "ANSWER ALL QUESTION
S WITH   ASCII VALUES": :
6 PRINT "TRY 30 AND 42 AS IN
PUTS."
9 B=3*16^2+15*16
10 INPUT "REDEFINE CHARACTER
:":C1
20 INPUT "AS CHARACTER:":C2
30 PRINT :: PRINT
50 A1=B+(C2-30)*8 :: A2=B+(C
1-30)*8
60 CALL LINK("VPEEK",A1,8,A$
):: CALL LINK("VPOKE",A2,A$)
:: GOTO 10
```

The next two routines are a save screen and a load screen. The first saves *everything* that is on the screen: Colors, character definitions and sprites. The only thing it misses is the screen color (anyone know how to find this?). It writes it to a file which will be nine sectors long on your disk. The next program then loads these data back in. You could use these routines to save a series of instruction screens, game screens or whatever you like for your program.

```
1 ! SAVE SCREEN
2 FOR Z=1 TO 5 :: CALL SPRIT
E(#Z,42,16,100,100,Z*5,-Z*5)
:: NEXT Z
3 FOR Z=3 TO 14 :: CALL COLO
R(Z,2,Z+1):: NEXT Z
10 DIM S$(20)
15 ! SAVE SCREEN IMAGE TABLE
20 FOR Z=0 TO 640 STEP 128
25 C=C+1
30 CALL LINK("VPEEK",Z,128,S
$(C))
35 NEXT Z
40 ! GET SPRITE ATTRIBUTE LI
ST
41 C=C+1
45 CALL LINK("VPEEK",3*16^2,
112,S$(C))
50 ! GET PATTERN TABLE (912
BYTES), SPRITE MOTION TABLE
(128) AND COLOR TABLE (32)
55 FOR Z=3*16^2+15*16 TO 8*1
6^2+2*16-1 STEP 128
60 C=C+1
65 CALL LINK("VPEEK",Z,128,S
$(C))
70 NEXT Z
100 OPEN #1:"DSK1.DATA-SCN",
OUTPUT,FIXED 128,DISPLAY
110 FOR Z=1 TO C :: PRINT #1
:S$(Z):: NEXT Z
120 CLOSE #1
```

```
1 ! LOAD SCREEN
10 DIM S$(20)
11 OPEN #1:"DSK1.DATA-SCN",I
NPUT ,FIXED 128,DISPLAY
12 FOR Z=1 TO 16 :: LINPUT #
1:S$(Z):: NEXT Z
13 CLOSE #1
15 ! LOAD SCREEN IMAGE TABLE
20 FOR Z=0 TO 640 STEP 128
25 C=C+1
30 CALL LINK("VPOKE",Z,S$(C)
)
35 NEXT Z
40 ! PUT SPRITE ATTRIBUTE LI
ST
41 C=C+1
```

(Please turn to Page 16)

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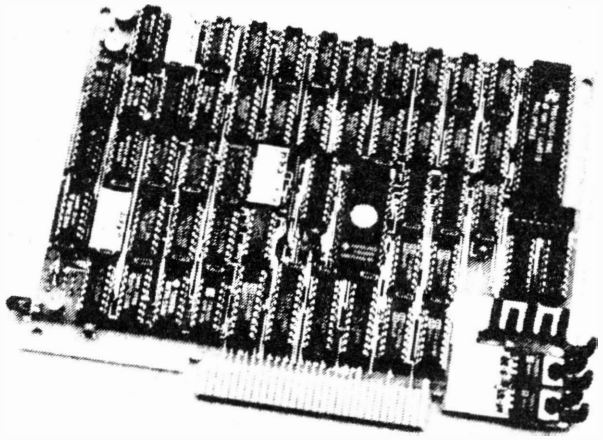

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(Continued from Page 14)

```
45 CALL LINK("VPOKE",3*16^2,
S$(C))
50 ! PUT PATTERN TABLE (912
BYTES), SPRITE MOTION TABLE
(128) AND COLOR TABLE (32)
55 FOR Z=3*16^2+15*16 TO 8*1
6^2+2*16-1 STEP 128
60 C=C+1
65 CALL LINK("VPOKE",Z,S$(C)
)
70 NEXT Z
75 CALL MOTION(#28,0,0)
80 GOTO 80
```

This next program changes the colors of *all* color sets to the same color, all at the same time. Note that each entry in the color table is one byte long. The first four bits indicate the foreground color and the last four bits indicate the background color.

```
100 INPUT "FOREGROUND COLOR:
 ":FC :: INPUT "BACKGROUND C
OLOR: ":BC
110 CALL LINK("VPOKE",8*16^2
+15,RPT$(CHR$(FC*16+BC-17),1
5))
120 GOTO 100
```

The following program allows you to move a line of boxes (the number of boxes is set in line 4) around the screen rather rapidly using the arrow keys and without disturbing what is already on the screen. You can make the line of boxes blink by removing the IF-THEN statement in line 50.

```
4 L=4
5 CALL CHAR(140,"FF818181818
181FF"):: CALL COLOR(14,16,1
4)
10 CALL LINK("VPEEK",2,L,B$)
:: CALL HCHAR(1,3,140,L)
20 CALL LINK("VPEEK",2,L,A$)
30 X=1 :: Y=3 :: P=X*32+Y-33
50 CALL KEY(3,A,B):: IF B=0
THEN 50
51 CALL LINK("VPOKE",P,B$)
60 IF A=83 THEN P=P-1 ELSE I
F A=68 THEN P=P+1 ELSE IF A=
69 THEN P=P-32 ELSE IF A=88
THEN P=P+32
70 IF P<0 THEN P=P+32 ELSE I
F P>32*24-L-1 THEN P=P-32
72 CALL LINK("VPEEK",P,L,B$)
:: CALL LINK("VPOKE",P,A$)
80 GOTO 50
```

To those of you who are not assembly language programmers, it might seem that you should be able to use a VPEEK on the area where the screen is stored to accomplish a sort of extended GCHAR routine to read a whole line (or more) of characters off the screen. This is partially true. You can read the screen image table, but all characters put on the screen are offset by 96. This means that a space character (ASCII 32) will be returned as an ASCII 128 when using a VPEEK. A short program given below gives an example of how to decode a string read off the screen using a VPEEK.

```
10 DISPLAY AT(1,1):"DEMO PRO
GRAM by J. P. Hoddie"
20 CALL LINK("VPEEK",2,28,A$
)
25 PRINT "UNDECODED STRING:"
:A$: : :
30 FOR Z=1 TO LEN(A$):: B$=B
$&CHR$(ASC(SEG$(A$,Z,1))-96)
:: NEXT Z
40 PRINT "DECODED STRING:":B
$: : :
```

This program will scroll the screen down two lines at a time. Similar techniques could be used to scroll the screen in any other direction in any increment.

```
1 FOR Z=1 TO 23 :: PRINT TAB
(Z);Z :: NEXT Z :: PRINT TAB
(24);24;
10 A=768-128
20 CALL LINK("VPEEK",A,64,A$
)
30 CALL LINK("VPOKE",A+64,A$
)
40 A=A-64 :: IF A=-64 THEN C
ALL HCHAR(1,1,32,64):: GOTO
10 ELSE 20
```

The following is a listing and explanation of some of the more interesting areas of VDP memory. For more information consult Millers Graphics' manual for their excellent Explorer program and the section on VDP access in the Editor/Assembler manual.

SCREEN IMAGE TABLE

Begins at: 0

Length: 768 bytes

Notes: This area contains the screen. To do the equivalent of a

CALL GCHAR(X,Y,C)

statement, you could use the following code (remember that all characters are offset by 96 in this table)

CALL LINK("VPEEK",X*32+Y-33,1,C$)

C=ASC(C$)

SPRITE ATTRIBUTE LIST

Begins at: 768

Length: 112 bytes

Notes: This area contains the position, character number and color for each of the 28 sprites. Each entry is four bytes long and is arranged as follows:

Byte #1: Vertical position - 1

Byte #2: Horizontal position

Byte #3: Character ASCII code - 96

Byte #4: Last four bits (lower nybble) contain the color -1

PATTERN DESCRIPTOR TABLE

Begins at: 1008

Length: 912 bytes

Notes: This area contains the character definitions for each character starting with character 30 and going up through character 143. Each entry is eight bytes long. Thus to VPEEK out the definition of character number C into A$, the following code could be used:

A=1008+8*(C-30)

CALL LINK("VPEEK",A,8,A$)

SPRITE MOTION TABLE

Begins at: 1920

Length: 128 bytes

Notes: This table contains the horizon-

(Please turn to Page 18)

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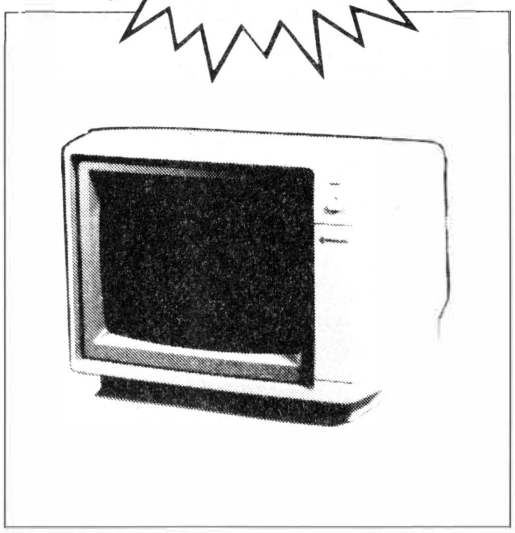

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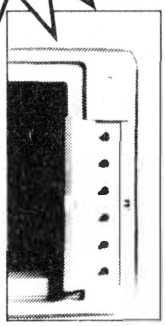

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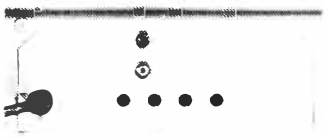

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(Continued from Page 16)

tal and vertical velocity for each sprite. Each entry is four bytes long, but the last two bytes of each entry are reserved for system use and so are not discussed here. The first byte is the vertical velocity and the second byte is the horizontal velocity. Note that velocities greater than 127 should be subtracted from 256 to obtain the correct velocity.

COLOR TABLE
Begins at: 2048
Length: 32 bytes
Notes: This table contains the color definitions for all 32 color sets. Extended BASIC only uses sets 0 to 14 which correspond to sets 7 to 21 in this table. See above program for an example of accessing these data.

NAME OF LAST DRIVE WRITTEN TO
Begins at: 16128
Length: 10 bytes

NUMBER OF DRIVE LAST ACCESSED
Begins at: 16373
Length: 1 byte
Note: This is a single ASCII character whose value equals the last drive accessed.

NAME OF LAST FILE ACCESSED
Begins at: 16374
Length: 10 bytes
Note: This is only the filename of the last file accessed. The drive number must be obtained using the byte before this.

Elsewhere, Barry Traver has pointed out the usefulness of subprograms in simplifying programming and improving the readability of programs. Taking Barry's advice I have listed below two sets of subprograms that will allow you to call the VPEEK and VPOKE routines without the need for a CALL LINK statement. The routines will work identically to the CALL LINK versions except that a slight decrease in execution speed will occur. Also note, however, that you will end up saving memory by using the subprograms below if you are using VPEEK and VPOKE often in your program.

```
32000 SUB VPEEK(A,L,P$):: CA
LL LINK("VPEEK",A,L,P$):: SU
BEND
32005 SUB VPOKE(A,P$):: CALL
 LINK("VPOKE",A,P$):: SUBEND
```

With the above lines installed you can call VPEEK by entering
CALL VPEEK(A,L,D$)
where A is the address to peek from, L is the number of bytes to read and D$ is the string to return the data in.

With the following set of subprogram definitions you can use the VPEEK and VPOKE routines just like the ones that come with the Editor/Assembler cartridge. Instead of peeking or poking a compete string, these CALLs peek or poke a single number. They are called as follows:
CALL VPEEK(A,D)
CALL VPOKE(A,D)
where A is the address to peek or poke to and D is the data to peek or poke.

```
32010 SUB VPEEK(A,D):: CALL
LINK("VPEEK",A,1,P$):: D=ASC
(P$):: SUBEND
32015 SUB VPOKE(A,D):: CALL
LINK("VPOKE",A,CHR$(D)):: SU
BEND
```

Jim Peterson has available two disks full of subprograms that you can merge into your own programs to extend your version of Extended BASIC. In the spirit of some of Jim's routines and to make some of the above code more useful and accessable to the less technical among us, I have included below a set of subprograms that can be merged into Extended BASIC programs. Also in the spirit of Jim's Nuts and Bolts disks I have numbered them consecutively so that you may use any of them without having overlapping lines.

The first subprogram is a variation of code given above. The routine is called DESPRITE and it essentially disassembles all information about any sprite that you request. You call DESPRITE exactly like you would SPRITE except you must leave out the number (#) sign. For example, to set sprite #10 moving in the same direction as sprite #4 with the same color and character pattern you could write the following:

```
2 CALL DESPRITE(4,CH,CO,X,Y,
XD,YD)
4 CALL SPRITE(#10,CH,CO,1,10
,XD,YD)

32020 SUB DESPRITE(B,F,G,D,E
,H,I)
32030 CALL LINK("VPEEK",764+
B*4,4,A$):: CALL LINK("VPEEK
",1916+B*4,4,B$):: D=ASC(A$)
+2 :: E=ASC(SEG$(A$,2,1))+1
32040 IF D>255 THEN D=D-256
32050 F=ASC(SEG$(A$,3,1))-96
 :: G=(ASC(SEG$(A$,4,1))AND
15)+1 :: H=ASC(B$):: I=ASC(S
EG$(B$,2,1)):: IF H>128 THEN
 H=H-256
32060 IF I>128 THEN I=I-256
32070 SUBEND
```

Along the same lines as DESPRITE there is the DECOLOR routine which returns the colors of a particular set. To set character set 10 to the same colors as character set 4 you could use the following:

```
2 CALL DECOLOR(4,FC,BC)
4 CALL COLOR(10,FC,BC)

32100 SUB DECOLOR(S,F,B):: C
ALL LINK("VPEEK",2063+S,1,A$
):: C=ASC(A$):: F=INT(C/16):
: B=C-16*F+1 :: F=F+1 :: SUB
END
```

If you have ever wanted to set all the sprites moving in the same direction at the same time you may have found it nearly impossible to start them moving all at exactly the same time. Using the following subprogram, MOVE_ALL, this is possible. To get all the sprites moving with velocity (10,-20) all you have to do is
CALL MOVE_ALL(10,-20)

(Please turn to Page 20)

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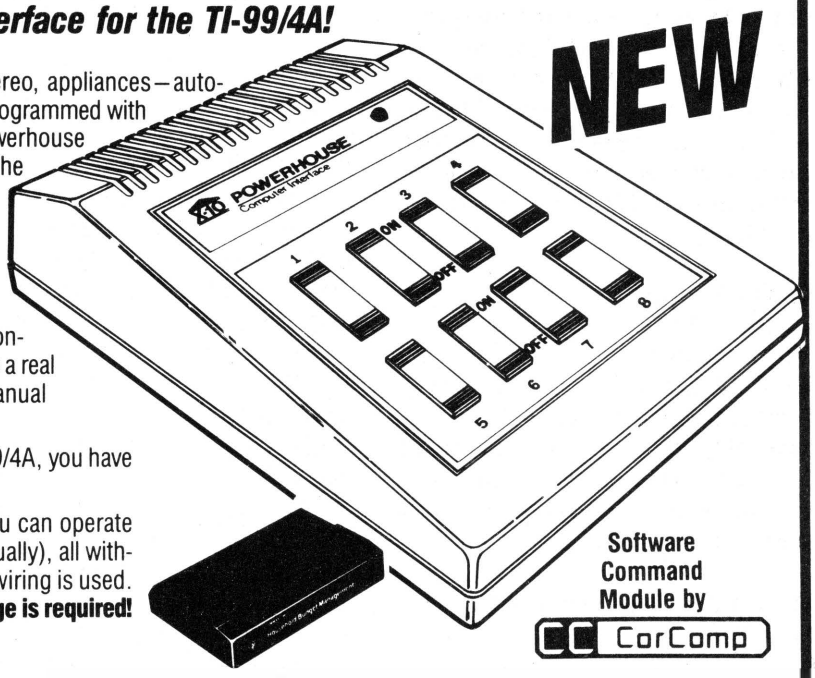

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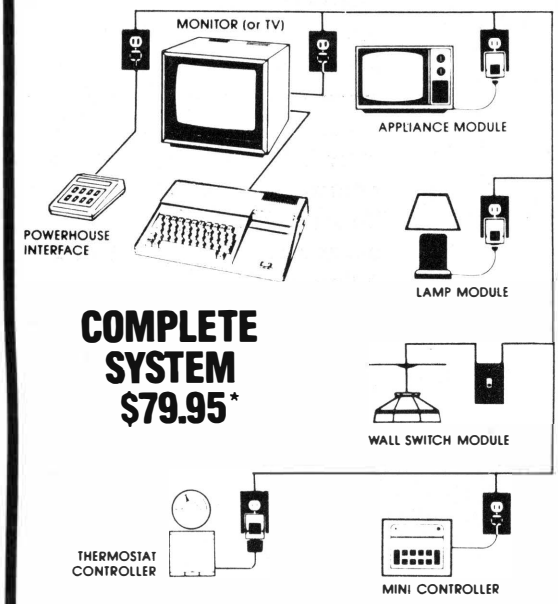

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(Continued from Page 18)

If you have sprites that are not in use you will not see them, even after this statement is executed. However, if you are hiding them off the bottom of the screen, this statement will set them in motion. A better solution than hiding them is to use a DELSPRITE command or make them invisible by setting their color to 1 (transparent).

```
32400 SUB MOVE_ALL(X,Y):: CA
LL LINK("VPOKE",1920,RPT$(CH
R$((X+256)AND 255)&CHR$((Y+2
56)AND 255)&CHR$(0)&CHR$(0),
28)):: CALL LOAD(-31878,28)
32405 SUBEND
```

You may have noted above that it is not very convenient to read a line of text of the screen because you have to subtract 96 from the ASCII value of each character after calculating the screen position. To simplify this, there is the GET_TEXT subprogram that does this automatically for you. You call it with

CALL GET_TEXT(X,Y,L,A$)

when X and Y are the coordinates on the screen to read the string from, L is the number of characters to read, and A$ is the string returned to you. So to read the first line of the screen you could write

2 CALL GET_TEXT(1,1,32,A$)

Note that in the first two and last two characters on any line put up by Extended BASIC will not be space characters as they appear but edge characters (ASCII 31). This could confuse you if you try to check the string returned from GET_TEXT with an IF-THEN without taking this into consideration.

```
32200 SUB GET_TEXT(X,Y,L,B$)
:: CALL LINK("VPEEK",X*32+Y-
33,L,A$):: FOR Z=1 TO LEN(A$
):: B$=B$&CHR$(ASC(SEG$(A$,Z
,1))-96):: NEXT Z :: SUBEND
```

Now borrowing an idea from Jim's Nuts and Bolts 2 I have included a subprogram to underline all the characters in the character set. To call it, all you have to do is

CALL UNDER_LINE

and fairly quickly all the characters (except for the cursor and the edge character) will be underlined.

```
32300 SUB UNDER_LINE :: FOR
Z=1031 TO 1919 STEP 8 :: CAL
L LINK("VPOKE",Z,CHR$(255)):
: NEXT Z :: SUBEND
```

Once again I am sort of borrowing from Jim, this time with a routine that will save the entire character set out to disk in MERGE format. You can then

(Please turn to Page 22)

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VDP UTILITIES FOR EXTENDED BASIC—

(Continued from Page 20)

merge this file into your program and in less than one second (for real) it will load in an entire new character set. To call the routine all you do is

CALL KEEP(F$,L)

where F$ is the file to write the MERGE format code to (like "DSK1.CHARS") and L is the line number for the MERGE format code to start at. There will be eight lines of code written by KEEP and each line will be incremented by one. The file that you MERGE into your program will take up just over 1050 bytes and you must have the VPEEK and VPOKE utilities loaded when you run the program that uses the MERGE file.

```
32400 SUB KEEP(F$,L):: OPEN
#154:F$,OUTPUT,DISPLAY ,VARI
ABLE 163
32405 FOR A=1008 TO 1919 STE
P 114 :: CALL LINK("VPEEK",A
,114,D$):: L$=CHR$(157)&CHR$
(200)&CHR$(4)&"LINK"&CHR$(18
3)&CHR$(199)&CHR$(5)&"VPOKE"
32410 L$=L$&CHR$(179)&CHR$(2
00)&CHR$(LEN(STR$(A)))&STR$(
A)&CHR$(179)&CHR$(199)&CHR$(
114)&D$&CHR$(182)&CHR$(0)
32415 L$=CHR$(INT(L/256))&CH
R$(L-INT(L/256)*256)&L$ :: L
=L+1
32420 PRINT #154:L$ :: NEXT
A :: PRINT #154:CHR$(255)&CH
R$(255):: CLOSE #154 :: SUBE
ND
```

Please note that you can *not* call user-defined subprograms from outside a program. That means that you can't do a CALL KEEP while in immediate mode. However, you can do a CALL LINK in immediate mode so you can VPEEK and VPOKE data while in immediate mode, assuming you use the CALL LINK TO access these commands, and not the CALL VPEEK or VPOKE described above.

The following is an Extended BASIC program that will "POKE" the VPEEK and VPOKE routines into memory. It must be run before any other assembly routines that may be used are loaded.

(Please turn to Page 26)

```
0 !"      "
1 CALL INIT
2 CALL LOAD(16368,86,80,79,7
5,69,32,38,114)
3 CALL LOAD(16376,86,80,69,6
9,75,32,38,24)
4 CALL LOAD(8194,38,186,63,2
40)
16 CALL LOAD(9702,32,32,32,3
2,32,32,32,32,32,32,48,49,58
,50,52,58,52,51,32,65,77,32)
17 CALL LOAD(9724,32,32,32,3
2,32,32,32,32,32,32,32,32,32
,32,32,32,32,32,32,32,32,32)
18 CALL LOAD(9746,32,32,32,3
2,32,32,200,11,38,22,2,224,3
6,244,4,192,2,1,0,2,4,32)
19 CALL LOAD(9768,32,12,4,32
,32,24,18,184,200,32,131,74,
37,20,4,192,2,1,0,1,4,32)
20 CALL LOAD(9790,32,12,4,32
,32,24,18,184,192,32,131,74,
2,1,37,22,192,160,37,20,2,66
)
21 CALL LOAD(9812,0,255,4,32
,32,44,4,192,2,1,0,3,2,2,37,
21,4,32,32,16,2,224)
22 CALL LOAD(9834,131,224,19
4,224,38,22,4,91,200,11,38,2
2,2,224,36,244,7,32,37,20,4,
192)
23 CALL LOAD(9856,2,1,0,2,2,
2,37,21,4,32,32,20,4,192,2,1
,0,1,4,32,32,12)
24 CALL LOAD(9878,4,32,32,24
,18,184,192,32,131,74,192,16
0,37,20,2,66,0,255,2,1,37,22
)
25 CALL LOAD(9900,4,32,32,36
,2,224,131,224,194,224,38,22
,4,91,32,32)
```

Here is the assembly language source code for the actual VPEEK and VPOKE routines, complete with comments.

```
        DEF  VPEEK          * DEFINE VPEEK ENTRY
        DEF  VPOKE          * DEFINE VPOKE ENTRY

STRREF  EQU  >2014          * REFERENCE TO THE GET STRING ROUTINE
STRASG  EQU  >2010          * REFERENCE TO THE RETURN STRING ROUTINE
NUMREF  EQU  >200C          * REFERENCE TO THE GET NUMBER ROUTINE

XMLLNK  EQU  >2018          * REFERENCE TO XMLLNK FOR CFI
CFI     EQU  >12B8          * DATA FOR "CONVERT FLOATING POINT TO
                            * INTEGER" ROUTINE

VMBW    EQU  >2024          * REFERENCE VDP MULTIPLE BYTE WRITE
VMBR    EQU  >202C          * REFERENCE VDP MULTIPLE BYTE READ

FAC     EQU  >834A          * ADDRESS OF "FLOATING POINT ACCUMULATOR"

MYREGS  BSS  32             * MY WORK SPACE REGISTERS

LENGTH  BSS  2              * FULL WORD FOR LENGTH BYTE FOR STRREF
                            * AND STRASG
BUFFER  BSS  256            * 256 BYTES FOR THE STRING FOR REF/ASG TO
                            * USE
RETURN  BSS  2              * SAVE FOR RETURN ADDRESS FOR ROUTINES

* CALL LINK("VPEEK",LOC,LEN,A$)
*  WHERE LOC IS THE ADDRESS TO READ FROM
*  AND LEN IS THE NUMBER OF BYTES TO READ
*  AND A$ IS THE STRING TO RETURN THE READ DATA IN

VPEEK
        MOV  R11,@RETURN    * SAVE RETURN ADDRESS
        LWPI MYREGS         * LOAD UP MY REGISTERS

        CLR  R0             * ZERO ELEMENT OF ARRAY, OR NO ARRAY
        LI   R1,2           * SECOND PARAMETER IN LINK
        BLWP @NUMREF        * GET THE NUMBER IN FAC
```

(Please turn to Page 26)

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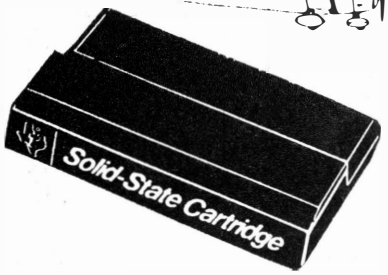

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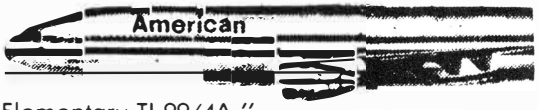

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VDP UTILITIES FOR EXTENDED BASIC—

(Continued from Page 22)

To use the VPEEK and VPOKE utilities you must either run the program listed above to "poke" it into the memory expansion, or you must assemble the assembly language source code provided above using the Editor/Assembler cartridge. Assemble it with the R option only and name the object file "DSK1.VDP". Once it is assembled you can load it into Extended BASIC with a

CALL INIT
CALL LOAD("DSK1.VDP")

If you find that you are using this assembly code often you might find it convenient to save it using a utility such as SYSTEX or XBALT. Having done this, you can load it quickly when you start up Extended BASIC. You might prefer to use SYSTEX or XBALT to save it with each program that you will be using them with.

The author may be reached by writing the Boston Computer Society, TI-99/4A User Group, Attn: J. Peter Hoddie, One Center Plaza, Boston, MA 02108 or by calling (617) 861-8733.—Ed.

```
        BLWP  @XMLLNK         * BRANCH TO ROM ROUTINE
        DATA  CFI             * TO CONVERT IT TO A ONE WORD INTEGER
        MOV   @FAC,@LENGTH    * MOVE CONVERTED INTEGER INTO LENGTH

        CLR   R0              * ZERO ELEMENT AGAN
        LI    R1,1            * FIRST PARAMETER IN LINK
        BLWP  @NUMREF         * GET THE OTHER NUMBER
        BLWP  @XMLLNK         * CONVÉRT IT
        DATA  CFI             * AGAIN
        MOV   @FAC,R0         * MOVE ADDRESS TO PEEK FROM INTO R0 FOR
                              * VMBR

        LI    R1,BUFFER       * PUT READ BYTES IN BUFFER
        MOV   @LENGTH,R2      * GET NUMBER OF BYTES TO READ
        ANDI  R2,>00F         * MAKE SURE IT IS NO MORE THAN 255 BYTES
        BLWP  @VMBR           * READ THE BYTES FROM VDP MEMORY

        CLR   R0              * MAKE SURE WE ASSIGN STRING TO ELEMENT
                              * ZERO, IF ARRAY
        LI    R1,3            * THIRD ELEMENT IN LINK
        LI    R2,LENGTH+1     * POINTER TO LENGTH COUNT OF STRING
        BLWP  @STRASG         * ASSIGN THE STRING

        LWPI  >83E0           * RELOAD THE GPL WORKSPACE REGISTERS
        MOV   @RETURN,R11     * RESTORE THE RETURN ADDRESS
        RT                    * AND RETURN

* CALL LINK("VPOKE",LOC,A$)
*  WHERE LOC IS THE ADDRESS TO WRITE TO
*  AND A$ IS THE STRING TO WRITE

VPOKE
        MOV   R11,@RETURN     * SAVE THE RETURN ADDRESS
        LWPI  MYREGS          * SET UP MY WORKSPACE REGISTERS

        SETO  @LENGTH         * SET MAXIMUM NUMBER OF BYTES TO READ
        CLR   R0              * ARRAY ELEMENT ZERO, IF ARRAY
        LI    R1,2            * SECOND ELEMENT IN LINK
        LI    R2,LENGTH+1     * SET POINTER TO STRING LENGTH BYTE
        BLWP  @STRREF         * GET THE STRING

        CLR   R0              * ZERO ELEMENT OF ARRAY, IF ARRAY
        LI    R1,1            * FIRST ELEMENT IN LINK
        BLWP  @NUMREF         * GET THE NUMBER INTO FAC
        BLWP  @XMLLNK         * BRANCH TO ROM ROUTINE TO
        DATA  CFI             * CONVERT FLOAT AT FAC TO INTEGER
        MOV   @FAC,R0         * MOVE CONVERTED INTEGER INTO R0 FOR
                              * ADDRESS FOR VMBW

        MOV   @LENGTH,R2      * GET NUMBER OF BYTES TO WRITE
        ANDI  R2,>00FF        * MAKE SURE IS NO MORE THAN 255
        LI    R1,BUFFER       * SET POINTER TO DATA TO WRITE FOR VMBW
        BLWP  @VMBW           * WRITE THE BYTES TO VDP

        LWPI  >83E0           * RESTORE GPL REGISTERS
        MOV   @RETURN,R11     * GET BACK THE RETURN ADDRESS
        RT                    * RETURN

        END
```


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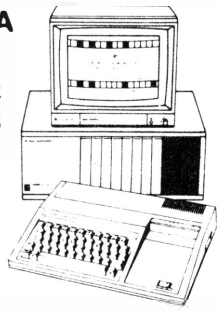

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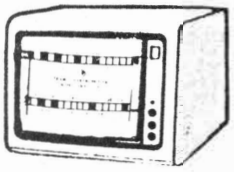

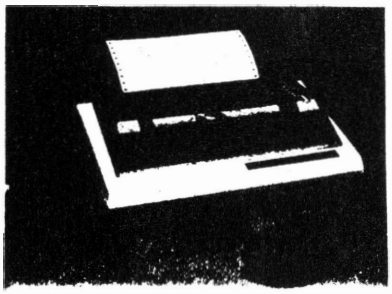

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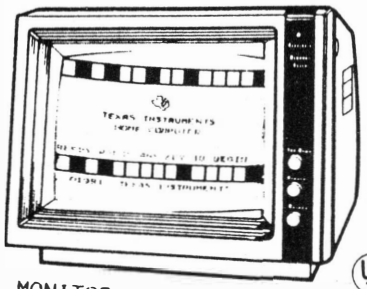

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Geneve on schedule, Myarc official says

Myarc's Geneve Model 9640 Family Computer is still scheduled for shipments at the end of July, according to Lou Phillips of Myarc.

The company is not taking orders, however, he says.

"We want to wait until we actually have them in production for that," he says.

He comments that one reason the company sent beta-test boards to software developers rather than produce its own software for the new "computer-in-a-card" was to test out hardware.

"We haven't had any boards sent back to us," he says.

He notes that the company requires software developers to give Myarc a deposit on the boards.

Chris Faherty is developing a window interface and Paul Charlton is working on DOS, Phillips notes. The company is also working on its BASIC 3.0 and a BASIC compiler, he says, adding that the BASIC compiler may also be available for the 99/4A.

Also, he says, "there are two folks working on a c-compiler."

Phillips says three cartridges will not run on the new computer, so Myarc is "working on software that will do the same thing, so that you have a BASIC program that will run your statistics program, for instance."

Statistics and Personal Record Keeping are two of the cartridges, Phillips said. At press time, the name of the third one was unavailable.

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Rave 99 has new keyboard

A Connecticut company is planning to market two enhanced keyboards for the TI99/4A. They are the RAVE 99 Model 99/101 and the RAVE Mode 99/84. Prices are $149.95 and $124.95, respectively. Quantity discounts are available. The keyboards are expected to be available to consumers by Oct. 1.

According to the company, both keyboards use a flexible cord to connect to the 99/4A console. The console may be placed out of the way to facilitate use of the enhanced keyboard. Features shared by both RAVE keyboards include: standard key layouts, including dedicated function keys; an alpha lock function that doesn't interfere with joystick operation; numeric keypad; single key entry of many TI-Writer editing commands and unique key codes returned from software that can be used by programmers without interfering with other software key calls.

The keyboard-to-console interface requires no soldering and includes provisions for user-installed system reset and load interrupt switches. Model 99/101 has six rows of keys, with function keys on the top row. A separate numeric keypad is located on the right side. The Model 99/84 resembles an IBM PC/XT keyboard with an integrated numeric keypad. Function keys are located on the left side of the keyboard.

For more information, contact RAVE 99 Co., 23 Florence Rd., Bloomfield CT 06002. Or call Rick (203) 242-4012 or John (203) 872-9272 after 6 p.m. Eastern Standard Time.

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BITMAC can make "slide presentations" for group meetings (and print the graphics!), give hours of "just doodling" pleasure, create charts for a stock holder report, print camera ready art for business ads, make still cartoon sequences (and print them in one of two sizes), create mechanical drawings, draft floorplans and many other uses!

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TI-CALC

A Window Calculator for the TI

By BILL HARMS

When I bought my TI99/4A the nice little plug-in calculator had to leave the desk to make room. Now, after two years, I have a calculator available again. I call it a Window-Calculator because I also wanted the ability to calculate sums or multiplications or percentages while in the midst of running a program on budgeting and checkbook recapping (or any other program). I put the following program into a shareware program done recently called FAS-Tran.

You can add an option to any menu or to any prompt off any screen to access this subprogram in Extended BASIC. It saves a portion (10 rows x 12 columns) of the screen to a numeric array and then recalls the portion of the screen when you exit the calculator.

I wrote the program in Extended BASIC because it was easier to use DISPLAY AT than in BASIC where one needs a short subroutine to simulate the DISPLAY AT command with CALL HCHARs.

This version saves the screen to a small string array and displays the calculator window.

I set up the calculator routine as a subprogram so all the variables used in the routine do not affect the variable values in one's normal program.

The line numbers of the subprogram are 20000+ so you can merge it into an existing program, hopefully avoiding already used line numbers. Another version I did printed the calcs just like an adding machine tape. It requires an additional 18 lines of code, including a user option for it.

The size of the whole thing is about 1,600 bytes (500 in stack).

The Window-Calculator works like any 10-key calculator. First enter a number. (All amounts are limited to 10 characters, including the sign(-+) and any decimal.) Then enter the operation code (+, -, *, /, %). Enter the second number. Witness the answer.

The cursor then returns to the operation code for input. Pressing "E" will exit the calculator. Pressing "C" will clear it for a another problem. Or, you may change the option code to multiply or perform another arithmetic operation. This will multiply the second number you'll enter and append the answer of the first calculation. This is the way one would add a column of numbers or, say, divide the result of a calculation by something to provide a new amount.

Users may change the program easily to use operation codes A for Add, S for Subtract, M for Multiply, D for Divide and P for Percent. This would allow one to avoid the shift key needed to enter the +, -, *, or %. It would be child's play (programmer child) to add operations such as SIN, TAN and SQR.

Window Calculator Program

```
100 CALL A
20090 !@P+
20100 SUB A :: OPTION BASE 1
 :: DIM A$(10):: GOTO 20130
20122 B$ :: C$ :: A :: B ::
C :: D :: E :: F :: G :: H :
: I :: J :: D$ :: K :: L ::
M :: CALL SOUND :: CALL CHAR
 :: CALL GCHAR :: CALL HCHAR
 :: CALL VCHAR :: CALL KEY
20126 !@P-
20130 !
20135 DISPLAY AT(24,1):"7 SE
C. PLEASE .." :: FOR F=1 TO
10 :: FOR G=19 TO 30 :: CALL
 GCHAR(F,G,A):: C$=C$&CHR$(A
):: NEXT G :: A$(F)=C$ :: C$
="" :: NEXT F :: DISPLAY AT(
1,18):" TI-CALC" :: DISPLAY
AT(2,18):"1st no:"
20345 DISPLAY AT(3,18):"" ::
 DISPLAY AT(4,18):"+-/*%CE"
:: DISPLAY AT(5,18):"2nd no:
" :: DISPLAY AT(6,18):"" ::
DISPLAY AT(7,18):"Answer:" :
: DISPLAY AT(8,18):"" :: DIS
PLAY AT(9,18):"Clear--End"
20390 I,J,D,E=0 :: CALL HCHA
R(8,20,32,10):: CALL HCHAR(9
,20,32,10):: CALL HCHAR(6,20
,32,10):: ON WARNING NEXT
20440 ACCEPT AT(3,18)VALIDAT
E(NUMERIC)SIZE(10):I :: DISP
LAY AT(9,18):"Clear--End"
20460 ACCEPT AT(4,28)SIZE(1)
BEEP VALIDATE("+-/*EC%"):B$
:: IF B$="" THEN 20460
20470 IF B$="E" THEN 20690
20520 IF J=0 AND B$="C" THEN
 20460
20530 IF B$="C" THEN 20640
20532 IF D$="X" THEN CALL HC
HAR(3,20,32,10)
20540 ACCEPT AT(6,18)VALIDAT
E(NUMERIC)SIZE(10):J :: IF D
$<>"X" THEN 20570
20560 I=K
20570 GOSUB 20745 :: DISPLAY
 AT(8,18)SIZE(10):K :: GOTO
20460
20640 D$="" :: GO TO 20390
20690 FOR F=1 TO 10 :: DISPL
AY AT(F,17):A$(F):: CALL SOU
ND(10,F*220,4):: NEXT F :: G
OTO 20900
20745 IF B$="%" THEN K=(I*J)
/100
20750 IF B$="+" THEN K=I+J
20760 IF B$="-" THEN K=I-J
20770 IF B$="/" THEN K=I/J
20780 IF B$="*" THEN K=I*J
20790 D$="X" :: RETURN
20900 !@P+
20910 SUBEND
```

Finishing FORTHFONT

By HOWARD H. ARNOLD

Starting in the March issue, we've published a series of articles using Forth to design fancy characters and to utilize them for labels and disk mailers. Screen 66, necessary to these applications, is presented this month along with discussion of file opening and menu techniques needed to "polish" the application.

Forth contains a built-in procedure for sending output to the printer in the word SWCH. SWCH opens the printer files with whatever default parameters are contained in its definition on screen 72. Then any ASCII character can be sent to the printer by simply following the ASCII code with the word EMIT. In our case, with large numbers of graphics symbols to be sent, it was more convenient to open our file directly. Screen 66 does this. (I learned this technique from code contained in Ken Caruthers' TE4TH, some of the most elegant and best commented Forth code I've seen. If you haven't already, get it! See MICROpendium's Freeware guide.)

```
SCR #66
  0 ( FILE SETUP SCREEN FOR GRAPHICS )
  1 6 SLA IN !        ( SELECTS LINE 2 OR 5 BASED ON # ON STACK )
  2 FORGET PRNTR
  3    HELP ABORT
  4
  5 PABS @ 78 + BF 6390 FILE PRNTR PRNTR SET-PAB DSPLY
  6 SQNTL VRBL 80 REC-LEN F-D" PIO.CR.LF" OPN ( SET UP PRNTR FILE)
  7
  8
  9
 10
 11
 12
 13
 14
 15

SCR #20
  0 ( CONDITIONAL LOAD  )
  1 : MENU CLS CR 272 264 DO I MESSAGE CR LOOP  ;
  2 : SLIT ( --- ADDR OF STRING LITERAL )
  3     R> DUP C@ 1+ =CELLS OVER + >R ;
  4 : WLITERAL ( WLITERAL word )
  5     BL STATE @
  6     IF COMPILE SLIT WORD HERE C@ 1+ =CELLS ALLOT
  7     ELSE WORD HERE ENDIF ; IMMEDIATE  -->
  8  ***** LABEL PRINT & FONT DESIGN *****
  9    n PRNTML to print disk mailer
 10    n RUN for labels (n is # to print)
 11    DES to design fonts. ARROW keys
 12    erase; <shift> ARROW paints des.
 13    <proc'd> saves des @ SCRN => 40.
 14           <enter> escapes.
 15         HELP gets this screen.

SCR #3
  0 ( WELCOME SCREEN )  0 0 GOTOXY  ." BOOTING..." CR
  1 BASE->R HEX 10 83C2 C!  ( QUIT OFF! )  15 BLOAD HELP ABORT
  2 DECIMAL (  84 LOAD )          16 SYSTEM
  3 HEX 68 USER VDPMDE  1 VDPMDE ! DECIMAL
  4 : -SYNONYMS  33 LOAD ;  : -EDITOR 34 LOAD ;  : -COPY  39 LOAD ;
  5 : -DUMP      42 LOAD ;  : -TRACE  44 LOAD ;  : -FLOAT 45 LOAD ;
  6 : -TEXT      51 LOAD ;  : -GRAPH1 52 LOAD ;  : -MULTI 53 LOAD ;
  7 : -GRAPH2    54 LOAD ;  : -SPLIT  55 LOAD ;  : -GRAPH 57 LOAD ;
  8 : -FILE      68 LOAD ;  : -PRINT  72 LOAD ;  : -CODE  74 LOAD ;
  9 : -ASSEMBLER 75 LOAD ;  : -64SUPPORT 22 LOAD ; : -CAT 89 LOAD ;
 10 : -VDPMODES  -TEXT -GRAPH1 -MULTI -GRAPH2 -SPLIT ;
 11 : -BSAVE     83 LOAD ;  : -CRU    88 LOAD ;
 12
 13
 14
 15 R->BASE
```

Now, let's talk a bit about the menu. Screen 20 has traditionally been used in

(Please turn to Page 32)

Whenever we load screen 66, either a file opening statement or a file closing statement is chosen depending on whether a 5 or a 2 is placed on the stack just before loading the screen. The sequence on line 1 of screen 66

6 SLA IN !

multiplies the number on the stack (2 or 5) by 64 and moves that number of characters into the screen before loading.

If a 5 appears on the stack, the load starts at line 5. This code establishes a peripheral access block, designates buffer BF as the location from which data will be written to the printer, and opens the printer file with the attributes PIO.CR.LF.

On the other hand, if a 2 appears on the stack when screen 66 is loaded, the load begins at line 2. The sequence FORGET PRNTR effectively closes the printer file. HELP simply prints the menu on the screen, and ABORT returns control to the Forth operating system.

Whenever the printer file is open, the word WRT simply sends the number of characters immediately preceding WRT to the printer from buffer BF. This makes it easy to make block moves into BF, then print them with a one-word statement, especially desirable for our graphics symbols which we use repeatedly.

FINISHING FORTHFONT—

(Continued from Page 31)

Forth applications for providing prompting legends at system startup. The word MENU on the Forth distribution disk calls a series of MESSAGEs from line 265 to 271. These line numbers, for reasons most apparent to the original Forth authors, are relative to line 0 of screen 4! So all we need do is to redefine MENU (and in our case, also define HELP) to refer MESSAGE to the lines we wish to use (264 to 271) and to replace the information on those lines with the prompting messages we wish to see. Screen 20 printed here reflects those changes.

And finally, in order to load all of the application screens from 60 through 69 at startup, as well as the editor, print support, file support, etc., we need to BSAVE the code of the operating system. To do this, we load all of the screens we wish to have automatically loaded, then save them in binary format with the sequence

' TASK 21 BSAVE .

This will save the entire Forth dictionary as it currently exists, starting at screen 21 for as many screens as required.

Now all that remains is to modify screen 3, which is always loaded automatically at startup, as shown here. These changes cause the binary file starting at screen 21 to be loaded and the menu to be printed on the screen. Remain aware that this procedure causes the ORIGINAL file to be loaded at each powerup, so changes you may make in the application screens are not automatically incorporated in your system. You need to FORGET to the first word of a screen you have changed and to reload that (and subsequent) screens to restore your system. Then, if you wish the changes to be incorporated into the system at powerup, repeat the BSAVE procedure above.

I guess that about wraps up FORTHFONT. I've had interesting correspondence with many of you and even some exciting adventures in tracking down bugs, especially as they apply to non-Epson printers. Thanks to all you "Freeware customers" for all your suggestions and comments.

Note: Readers can minimize typing and debugging by ordering the disk containing this series of programs from Howard H. Arnold, 210 Beech Valley Rd., Lewisville NC 27023. Arnold offers it as Freeware but asks users to enclose $5 for disk, postage and handling.

Freeware Update

Anyone wishing to have a Freeware announcement included in MICROpendium's Freeware listing may do so by submitting a copy and brief description of the program, and a note indicating that it is in the public domain, to MICROpendium. Complete Freeware listings, updated quarterly, are available from MICROpendium for $1 (or 50 cents and a self-addressed stamped envelope). Freeware announcements will continue to be published in the listing until withdrawn by the persons submitting them or the publisher.

FILEMASTER 4

Filemaster 4 is a personal filing program that stores up to 100 records per file. Users may add, modify or delete entries. Entries may be displayed to the screen or dumped to a printer. Included is a custom lowercase character set. The author will provide disk and postage to those who do not wish to send return mailer and disk. The author is Jesse Slicer, 1101 N. Purdom St., Olathe, KS 66061-2717.

FRACTAL EXPLORER

Fractal Explorer by Steve Langguth is a unique graphics program that is used to create multi-color fractal images. It requires Editor/Assembler, a memory expansion and disk system. Images may be saved to disk. It includes the capability to magnify portions of an image almost infinitely. The images are highly geometric and extremely complex. (Fractals are shapes that are "infinitely squiggly.") According to the author, images explored with Fractal Explorer are known as the Mandelbrot Set, named after Benoit Mandelbrot, developer of fractal geometry. The program comes with extensive documentation. The author asks for a donation to encourage development of additional programs. Send disk and stamped, return mailer to Langguth at 2956 S. Barnes, Springfield, MO 65804.

CASINO CRAPS

Casino Craps is being offered by Leo W. DuBry, 325 S. Center St., Longview, TX 75601. The program requires Extended BASIC. The program uses graphics and sound effects to simulate a craps game. Entry is via the ENTER key only. The game keeps a running tally of the amount of "money" the player loses or wins. Send $5 to DuBry (he will provide disk and postage).

MAILLIST

Don Hale, 3120 Midway Dr., Santa Rosa, CA 95405, is offering MAILLIST. The program requires a memory expansion, two disk drives and Super Extended BASIC (SXB) by J&KH Software, 2820 S. Abingdon St., Arlington, VA 22206. The program is used to input and store names, addresses and telephone numbers for labels or letters. Major functions include: transformation of a TI-Writer file into a format read by MAILLIST; edit a document in the MAILLIST format; reconfigure printer defaults; and format a name/address list written using TI-Writer to a MAILLIST file. Labels can be dumped to printer by ZIP code. The author asks for a donation.

When ordering Freeware, enclose a self-addressed stamped mailer, required disk(s) and a cover letter describing your order. Allow four weeks for delivery.

Horizon RAMdisk

User has choice with Horizon card

By JOHN KOLOEN

As far as I know the Horizon RAMdisk is the only peripheral expansion box card that is being marketed in kit form. To be sure, the card also comes fully assembled (which is the version I reviewed). The assembled version is about $60 more than the kit when all expenses are figured in. The kit includes a PC board, manuals, parts list and software and costs $53. The buyer purchases other parts locally, including memory chips, getting the best price he can find. The parts should be easily obtainable at most electronics supply houses. While the kit does not have a warranty, the assembled version carries a 90-day warranty.

What is a RAMdisk? Simply, it is a device that emulates a floppy disk. The RAMdisk is used to store programs and files like a floppy, but accessing this data using the RAMdisk is much faster. Loading and saving programs and files with a RAMdisk is 5-10 times faster than a floppy disk. The principal difference is that when you turn off the system the data on the floppy disk is still there while the data in the RAMdisk is wiped out. However, the Horizon RAMdisk is battery backed, which means that anything stored in the RAMdisk remains there even when the computer is turned off. The card uses rechargeable batteries that are recharged while the computer is on, thus insuring that the contents of memory will remain intact for as long as the batteries remain in place.

Unlike several other RAMdisks, the Horizon RAMdisk requires a 32K memory expansion. It appears to be compatible with the TI, Foundation and Myarc memory expansions. (Others, such as the CorComp memory expansion, were not available for testing.) However, there may be problems associated with some disk controller cards and other peripheral cards. This is primarily due to the fact that the RAMdisk operates best when using the CRU base address of >1000.

Review

Report Card

Performance	**A**
Ease of Use	**A**
Documentation	**A**
Value	**B+**
Final Grade	**A**

Cost: $53 kit; $165 (360-sector assembled version), $210 (720- sector assembled version)
Manufacturer: Horizon Computer Ltd., P.O. Box 554, Walbridge, OH 43465
Requirements: Console, monitor or TV, memory expansion, disk drive system, Extended BASIC, Mini-Memory or Editor/Assembler

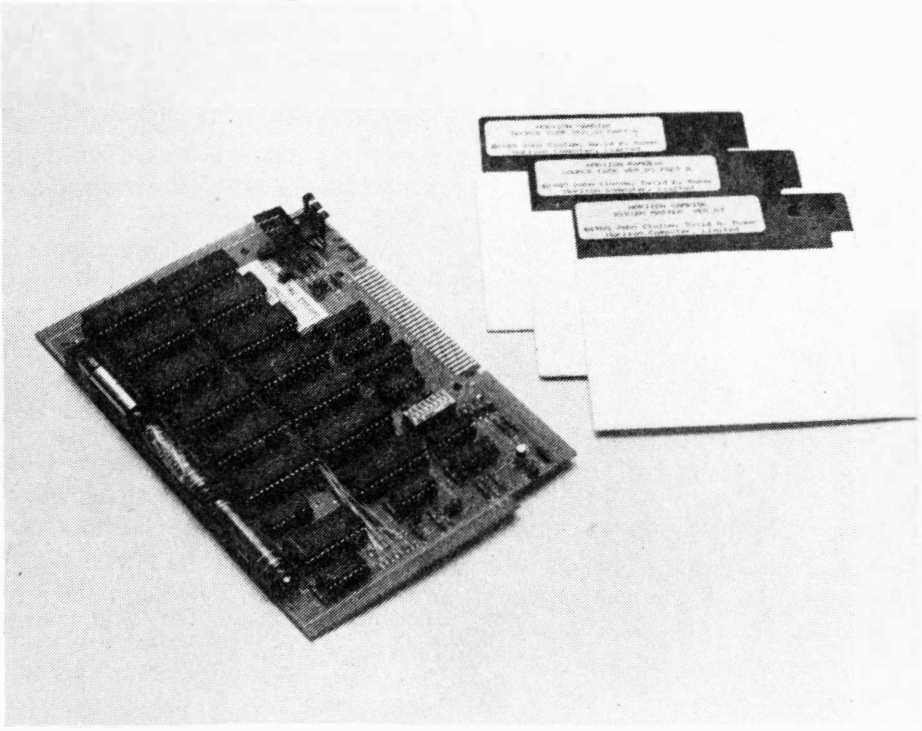
This is done so that the RAMdisk is the first device checked on any input/output operations. Some peripheral cards use the same CRU address for the same purpose. When two devices use the same address the result may be a lockup of the computer or the locking out of one of the devices. Because of this I strongly recommend that anyone ordering the card inquire first about compatibility with his existing PEB configuration. Unlike most other cards, the RAMdisk includes a DIP switch to allow users to change the CRU address.

Performance: The Horizon RAMdisk comes with a disk-based operating system. Once loaded operation of the RAMdisk is transparent to the user.

The RAMdisk also comes with DM-1000, a disk manager distributed by the Ottawa TI99/4 User Group. This is used to initialize the RAMdisk. Disk Manager II may also be used. The RAMdisk is available in two configurations: 104 kilobytes and 192 kilobytes. The 104K configuration is the equivalent of a single-sided floppy disk. The 192K configuration is the equivalent of a double-sided floppy disk.

After initialization the RAMdisk is

(Please turn to Page 34)



HORIZON RAMDISK—

(Continued from Page 33)

available for use as a storage device. A number of subroutines are provided to aid the user. They include:

—CALL DN(n). This is used to set or change the disk drive number of the RAMdisk. When installed, the RAMdisk is referred to as DSK3, though it can be changed to anything from 1 to 6.

—CALL MS(n). This is used to set the maximum number of sectors the operating system recognizes. For a 104K RAMdisk, the statement would be CALL MS(360).

—CALL WO. This write-protects the RAMdisk. It's analogous to placing a write protect tab on a floppy disk.

—CALL WF. This turns off the write-protect.

—CALL EX(adr). This is used to transfer control of a BASIC or XBASIC program to a specific address of CPU memory.

—CALL CO. This turns the card on by enabling the RAMdisk operating system.

—CALL CF. This turns the card off. The CALL CO/CF statements when used with the CALL EX subprogram allows users to link to the operating system from BASIC.

—CALL DM. This is used to load DM-1000 when the two disk manager files are loaded into the RAMdisk.

—CALL NF(n). This is used primarily when the CRU base is not 1000. The "n" is set to a number greater than the maximum number of drives the disk controller can access. This allows BASIC and other programs to access the RAMdisk. When the CRU address is 1000, NF is of little use.

—DELETE "XBCALL". Executed after entering CALL INIT, this statement downloads the machine language for all CALLs into the low 8K of the 32 memory expansion. The routines are then accessed using CALL LINK statements. (DELETE does not mean "delete." The DELETE statement is also used in the Foundation Computing 128K memory expansion. It is the only I/O command that does not include error checking.)

The DELETE can be run from an Extended BASIC program, allowing RAMdisk CALL LINK statements to be used in auto-loading programs. This is a very interesting feature in terms of its usefulness in chaining programs together.

—CALL ? Enter user-defined subroutines in place of the question mark. Assembly language programmers can have a field day with this one.

The RAMdisk operates much like a floppy disk drive, using the same conventions for disk access—OPEN, CLOSE, deleting and saving files and programs, etc.—as a floppy and may be accessed by disk name or drive number. The contents of the RAMdisk may be cataloged with the same programs used to catalog floppies.

Among the more common uses of a RAMdisk is to store applications files for such cartridge-based programs as TI-Writer, Microsoft Multiplan and Editor/Assembler. Loading the editor or formatter files for TI-Writer, for example, is much faster when the files are located in the RAMdisk than on a floppy. Of course, access to files written by these and other programs is much faster when writing or reading from the RAMdisk compared to similar operations on a floppy.

Ease of Use: The Horizon RAMdisk mimics a floppy disk so well that anyone familiar with the operations of a disk drive should take to it very quickly. It provides considerable potential for very sophisticated hobbyists yet can benefit virtually any user.

Documentation: The manual easily earns an "A." It serves first as a tutorial and secondly as a reference for the card. It goes from the simple to the complex, and is very well organized. The first 12 pages get you going, the next three are devoted to trouble-shooting, and include phone numbers for help if you have trouble. The next 10 pages are dedicated to advanced applications, including examples on how to write CALL routines. Subsequent to this is a self-contained section on assembling the RAMdisk kit. Also included is a manual for DM-1000, which is included with the RAMdisk. The manual is printed on 8½ x 11 paper and is punched for a three-hold binder.

Value: Perhaps the only disadvantage to the Horizon RAMdisk is that it requires a 32K memory expansion to run. Those who already have a memory expansion would not be affected by this, but those who have yet to buy a memory expansion may want to think twice about this. Offsetting this to some extent is the fact that the RAMdisk is available as a kit, as well as fully assembled. The hobbyist who enjoys do-it-yourself hardware projects certainly will find the Horizon kit to represent a good value and will probably learn a lot about the operations of his computer.

While the Horizon RAMdisk doesn't offer features found in some other RAMdisks (it doesn't function as a print-spooler), this device is well-designed and easy to use. The fact that its batteries are constantly recharged while the computer is running is an extremely useful feature. I wish that other battery backed devices were designed to be self-recharging.

How well the Horizon RAMdisk is supported is a question that I cannot answer, since this is the first product of Horizon Computer Ltd. This product started out as a user group project with the principal participants including John Clulow, Ron Gries and D.R. Romer. (Clulow is no longer affiliated with the RAMdisk project.) The company claims that hundreds have been sold. Its designers apparently have confidence in it or else they wouldn't have published their home telephone numbers in the manual.

Overall, I like what this card does and how it does it. It lives up to the claims made for it by its manufacturer.

Old Dark Caves

Magical and with animation

By ROBERT NEAL and GAIL WYANT

An interesting advertisement recently described Old Dark Caves in MICROpendium. It promised to deliver colorful animated graphics and was an adventure game as well. We were a bit apprehensive as to whether or not the game would be worth the asking price of $19.95.

The basic story line has the player on a mission to rescue a friendly dragon who was kidnapped by a group of evil wizards. Along the rescue route, there are treasures to be found and 24 animated creatures (some with very poor manners) to deal with. The game shares some similarity with Tunnels of Doom, but the use of animation, magic, and some added little twists make this graphic adventure game stand on its own.

To begin your adventure you are taken first to the Dark Caves store. Here you select the game options, setting the difficulty level and character trait. You must also purchase goods such as armor, swords, food and fireballs. You are limited to purchasing only one weapon and one piece of armor.

After you have purchased all your supplies, or spent all your gold, the game gets under way.

In all, there are 216 caves divided into three upper and three lower levels each. The dragon is held somewhere in the lowest cave level, while the adventure starts in the uppermost level. In each of these caves you may find monsters, treasures, snakes, goblets, and even fountains. When you find a fountain you may take a drink from it. But beware, each drink may help you, or it may deter you by diminishing your strength.

To descend a level, an adventurer must find keys, which are usually found after going into combat with a monster or two. To enter the lower caves, it is necessary to locate six pieces of the sorcerer's amulet. Prior to entering the lower caves, a stop must be made at Elvis Ogre's shop to purchase better weapons and armor (note that Elvis was a famous musician in the upper world who has retired to the caves as a shopkeeper). An interesting diversion at the store is a blackjack game which provides entertainment for weary travelers and is useful for winning (or losing) money.

As the game plays two-thirds of the screen shows action and the lower third displays important printed information. The information consists of player and monster status and a battle magic menu. This information is updated throughout the adventure. The variables include:

Power—Shows health and ability to withstand attack. Power is increased with each monster you defeat.

Food—As you travel through the caves, your food supply is continually being consumed. When your supply hits 0 your power level begins to decrease. When the food and power levels hit 0 the adventurer dies and the game is over.

Gold—Used to purchase items from the cave trader, or get healed by the cave healer. You may also use gold to buy off an attack from a monster.

Armor—Lessens the damage during

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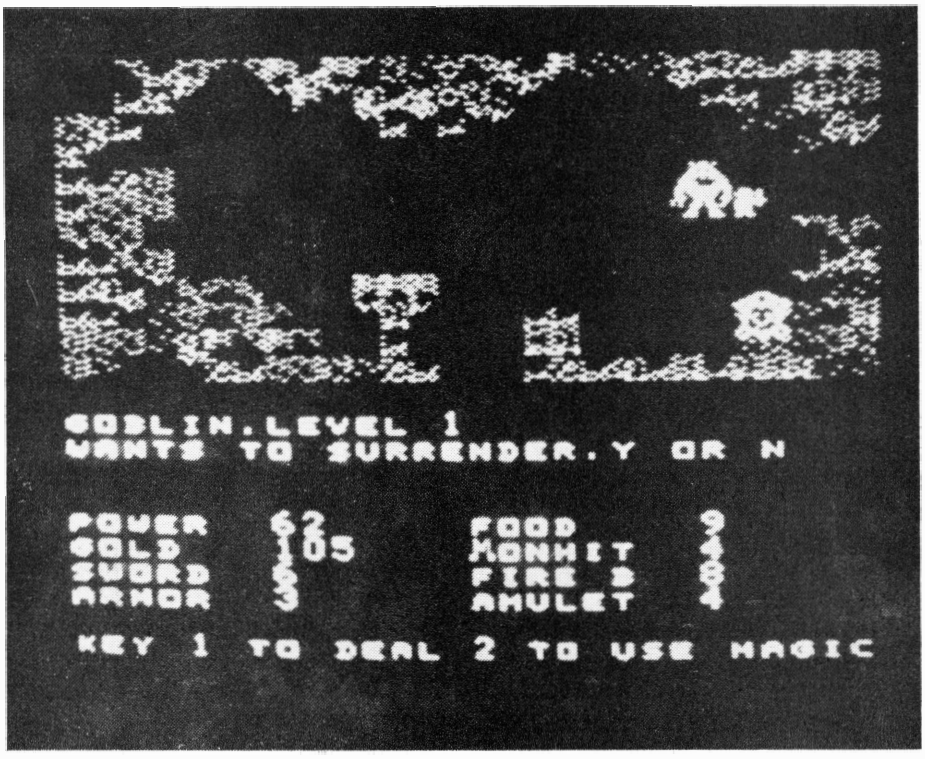
Review

Report Card
Performance.....B
Ease of Use.....B+
Documentation.....A
Value.....A
Final Grade.....A-

Cost: $19.95 (disk)
Manufacturer: Donn R. Granros, 6320 4th Ave. South, Minneapolis, MN 55423
Requirements: Console, monitor or television, Extended BASIC, memory expansion, disk system.



Funlwriter

A program with great versatility

By JOE NUVOLINI

I recently received an exceptional Fairware disk from two gentlemen in the Hunter Valley 99 Users Group in New South Wales, Australia.

Their names are Will and Tony McGovern and the disk contained version 3.3 of Funlwriter which, according to an earlier letter I received from Tony, will be the definitive version of this program.

This is by far the most versatile program I have seen for the 99/4A. It allows you to use TI-Writer and the Editor/Assembler without their respective modules. The program auto loads from Extended BASIC and will also load from TI-Writer, the Editor/Assembler or the Mini-Memory module. The disk contains TI-Writer, the Editor/Assembler, Disk Manager 1000 ver. 3.1 (a Freeware program of the Ottawa Users Group), a sector editor and a Forth loader. You can also load your assembly programs without the use of any modules except Extended BASIC. To run the disk you need the console, 32K memory and the disk controller and drive. It also helps to have a second disk drive and a printer.

There is a file called —READ ME— and six FWDOC files that should all be printed using the TI-Writer Formatter and—more important—read before you begin. When you're done with that, then copy the Funlwriter disk so you have a working copy and put the backup copy away in a safe place.

Before loading the program, examine the LOAD program. Line 120 allows you to set the primary and alternate screen colors. Lines 130 and 140 set the default options for the PF option of the Editor (130) and the Formatter (140). Lines 160 through 190 allow you to enter the names of programs you want on the User's List option while lines 240 through 280 are the load command for these options. You can set a value for K in line 210 that will be the default for the drive number

Review

Report Card

Performance ..... A+
Ease of Use ..... A+
Documentation ..... A
Value ..... A+
Final Grade ..... A+

Cost: Freeware donation
Manufacturer: Tony and Will McGovern, 215 Grinsell St., Kotara, New South Wales 2289, Australia
Requirements: Console, 32K memory expansion, disk drive and controller; two or more disk drives, RS232/PIO printer optional

that appears on the screen with DSK. DO NOT RESequence the program or you will destroy the LOAD program. The FWDOC/LOAD file explains how to set up the User's List options and the various methods of loading Funlwriter.

Now select a method and let's load the program. The first thing you'll see is the title screen followed by the first menu with three selections: TI-Writer, Edit/Assm and User's List. We'll cover option three, User's List, later in this review. If you select option 1 or 2 you arrive at the central menu which has six selections. They are Editor, Formatter or Assembler, DM1000, Utility, Switch and Reset. Selecting Switch changes option 2 to Assembler, c-Compiler and back to Formatter so you can switch between these functions.

I might mention here that the files C99B through C99E will load REL2 of the c-Compiler by Clint Pulley. It loads from this menu using file C99B through E. This is the preferred method of entry. It may also be loaded from the program file loader, discussed later, by entering C99C at the filename

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FUNLWRITER—

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prompt. You must have the rest of Clint Pulley's small-c files for this option to be of any use.

Pressing Reset places the current filename you have been working on into the mailbox so that if you leave TI-Writer or E/A and go to another Funlwriter function, say DM1000, and then return to TI-Writer, when you select Editor or Formatter that filename will be there for you to load or print. After Reset is selected the option six name changes to Quit and pressing that option returns you to the Master Title Screen. We'll discuss option 4, Utility, after we finish our discussion of TI-Writer and E/A.

If you select option TI-Writer from the first menu you then can select the Editor or Formatter from the central menu. The Editor functions like the TI-Writer editor with the three following improvements:

1. If the loader can find a filename in the mailbox it writes it into the LF/SF buffer, which otherwise shows DSKx. when called up with x being the default disk drive set in the LOAD program.

2. The quit function remains disabled at all times while in the Editor.

3. The Show Directory (SD) function is an assembly routine that allows single key paging through the files. Pressing "=" causes the program to check and indicate the type of program files on the disk. Fractured files are indicated by an asterisk after the file length.

The Formatter is the same as TI-Writer's with the following improvements:

1. There is now a Quick Directory (QD) function here from any menu in the program. To access it, you enter FCTN 7 (AID). It operates in the same way as the SD function in the Editor.

2. The Formatter will automatically display the last file used when it can find one. If no name is present then DSKx. appears.

3. The FCTN 9 key allows you to return to the Funlwriter central menu.

If you need to reload either the Editor or Formatter immediately after exiting them they do not need to reload from disk.

If you select the Editor when Assembler or c-Compiler is in the second position of the central menu, a modified version of the TI-Writer Editor is loaded which is suitable for use as a source code Editor. Word wrap is disabled, E/A tab defaults are set and no final tab record is written to disk. To write a DF80 file to disk you use the PF option using F Dskxetc as described in the TI-Writer manual. The Source Editor loads CHARA2 which is slightly different than the CHARA1 file that is loaded by the TI-Writer Editor. This acts as a reminder to let you know which editor you are in.

The Assembler has some enhancements added. The filenames are visible on the screen while it is executing. You can use AID to give you QD, allowing you to check the filename on the disk. If a filename is found in the mailbox it is written as the source code filename and the object code is the same name with the last two characters removed. Also R is automatically entered in the Options field of the Assembler as default value.

Utility, option 4 on the central menu, brings you an assortment of assembly file loaders called the Program Load Environment (PLE). This menu displays five options on the screen but has a total of eight options, the last three of which are entered in the blind.

Option 1 is for loading TI-Writer utility files like Dragonslayer's Spellchecker.

Option 2 sets up a GPL environment for loading other self-contained program image files while option 3 is the E/A "RUN PROGRAM FILE" function. It should be noted here that the program file loaders will support cassette files by entering "CS1." (See E/A manual for more information on this function.)

Option 4 is the E/A "LOAD-RUN" function and handles object files, compressed or not, and even displays the DEF table so you don't have to remember the program execution name if the program does not auto start.

Option 5 is RE-ENTER (1-3) and it allows immediate re-entry to a program without reloading it, assuming it is re-enterable.

The invisible options (6, 7 and 8) allow other object code loading options but in the interest of brevity I will not go into them here. Information on these options can be found in the FWDOC-EASM file. Entering FCTN 9 from this menu returns you to the central menu.

Now we'll discuss the User's List option, option 3 on the first menu. This menu has nine options. The first eight options can be user defined, although the LOAD program comes set to run DM, the Myarc disk manager, as option 6, Dpatch; the TI sector editor DISKO as option 7; and a TI-Forth loader as option 8. Option 9 is BACK and it will return you to the Funlwriter title screen. This menu is set in the LOAD program, as are the loaders. You can run XB programs, E/A programs or object files from this menu if the corresponding files are placed on a Funlwriter disk. The XB programs are called by a RUN "DSK1.filename" statement. The E/A files are loaded using a CALL LINK("UTILA",filename,K). The numeric parameter K is the same as would be entered from the PLE discussed earlier, i.e., 3 for an E/A program file and 4 for an object code file.

I find this part of the program particularly useful as you can put your favorite utility programs on the Funlwriter disk and have them available. In addition to TI-Writer and E/A I have Masscopy, Fast-Term, 4A/Talk, PRBASE, DM1000, Dpatch, the TI-Forth loader and a program called Recall, all available through Funlwriter. I rarely take it out of drive #1. I should mention that I am using a double-sided disk to hold all of that. You will be somewhat restricted as to what you can put on a single-sided disk with the Funlwriter files.

There are several other files supplied

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OLD DARK CAVES—

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an attack. Some monsters though will destroy armor.

MONST/MONHIT—MONST show the number of hit points that a monster has during a battle. MONHIT shows the strength of the monster's attack. These numbers are alternated during play.

Sword—Attacks with your sword are rated as hit, miss or glancing blow. Percentage of hits increases with experience.

Fireballs—This is the best means of defense, but supply is limited. You may attack a eonster from a distance with the fireballs.

Amulet—The amulet is the most interesting item to use. With it you may use eight approaches to defeat the monsters. As an adventurer, you are given magical traits to utilize during your travels. The amount of magical power needed varies with each of these traits. The amulet shows the amount of magical power that you possess.

There are a lot of little details that one learns while playing. Strategy is important—1) knowing when to fight and when not to fight; 2) some monsters respond to kindness; 3) some are greedy; 4) some sneak your food supply away; 5) some are simply vicious.

Care must be taken when using your magic as it must be renewed via treasure discoveries, encounters with the cave trader, cave healer, and magic fountains.

Performance: If there is a drawback to Old Dark Caves it would be the amount of time it takes to load a game. It takes a little over two minutes to load the assembler routines. Once a game is loaded though no further disk access is required. We have talked with the author of the program and have informed him on how this load time can be cut down to a mere 12 seconds.

The game itself plays quickly with the use of assembler routines. Screen changes are performed almost instantly. The animation of the monsters and of the items within the caves are well done, but the adventurer character itself pales in comparision to the rest of the cave characters, and movement is somewhat slow.

While we have not played the entire game (could take days, weeks, months?) we did not encounter any problems while playing. We should also point out that during your travels through the caves, you may save the game and return turn it later.

It should be noted that our review is based on version 2 of the program, which is the most current release. The author has made several changes from the previous version, making the game more enjoyable to play.

Ease of Use: The game is easy to load and use. Two disks are supplied, one labeled LOAD and the other GAME. You simply place the LOAD disk in the drive, call up XBASIC and the game begins to load. The LOAD disk contains the assembly code used during the game, as well as the source code. The GAME disk is the game itself which is broken into two segments: the upper caves and the lower caves.

Documentation: The documentation is included on nine pages and is well-written and wry. The author gives a little background information, plus a couple of hints for playing the game.

Value: The $19.95 is a fair price for all of the detail put into this game and the enjoyment derived from it.

If you are interested in adventure games, you'll enjoy this one. With its colorful animation and unexpected dangers all ages of adventurers should find it interesting.

FUNLWRITER—

(Continued from Page 37)

with Funlwriter that deserve mention here. FWSAVE utility is for use with E/A for converting object files to memory image program files. UPATCH is a patch that creates a file called UTIL1 once you have your screen color and printer defaults set in the LOAD program. UTIL1 is used to re-enter Funlwriter from several areas. APATCH file is used to modify the ASSM2 file from your original E/A disk to work with Funlwriter. The ASSM file so created is 22 sectors long, two sectors longer than the original. You will probably find that this has been done for you by someone already. FWRMM is for use with the Mini-Memory module to load the UTIL1 file into high memory.

Will and Tony have set no price for this program, but merely say, "I can suggest only that you judge the program on its own intrinsic merits, perhaps measuring its worth by how much you use it as compared to other 'fairware' or commercial programs that you use."

I might suggest you do what our users group, the Front Rangers, did. We collected donations from the members of our users group who wanted the program and sent one international money order from the club to the authors. Be sure to include two disks when ordering your copy unless you have double-sided capability, as the DOC files are more than 200 sectors long. Also be sure to enclose a couple of dollars postage as mail to and from Australia is not cheap!

This is truly a fine piece of software. Let's make sure the authors are adequately compensated for their work.

Chicago TI Faire set for fourth year

The Chicago Area TI Users Group is scheduled to hold its Fourth Annual TI Faire Nov. 1 at Triton College in River Grove, Illinois.

General admission will be $2, according to Michael J. Chappell, publicity chair for the event. Chappell says that the 1985 Faire attracted more than 2,000 attendees.

For further information, contact the Chicago Aria TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657.

TI99/4A Macro Assembler

Speeds up your code writing

By JOHN CLULOW

The TI99/4A Macro Assembler from RAG Software is a powerful new tool for assembly language programmers. The assembler provides for macro instructions and directives along with standard TMS9900 mnemonics. Macros are operations like OPEN, CLOSE, INPUT, PRINT, BEEP, GET, IF, etc. Macros are used in source statements like standard mnemonics, but when the assembler encounters one it generates several lines of ordinary source code.

Assembly language affords maximum speed and access to machine resources, and it has attracted many users over the past couple of years. However, a major disadvantage is the large volume of souce code required for even simple applications. The TI99/4A Macro Assembler makes the process of writing assembly language more efficient by dramatically reducing the number of lines of code required.

The TI99/4A Macro Assembler package consists of two disks. They contain the macro assembler, a library of macro instructions and directives, source code for two subprograms used by the macros and an excellent users manual ready for the TI-Writer Formatter. Any editor that produces DIS/VAR 80 files may be used to write source code for the Macro Assembler (e.g., TI-Writer or Editor/Assembler).

The disks also contain the source code for two programs written using the TI99/4A Macro Assembler: a terminal emulator and a disk cataloging program. These two programs illustrate almost every aspect of writing source code for the Macro Assembler.

This polished, professional package would be a bargain at $50. However, it is being offered as "freeware" by its author, R.A. Green, a professional programmer and member of the Ottawa Users Group. He asks that the package be passed along in its original form and that anyone who likes it and uses it send him a contribution.

Review

Report Card

Performance ..... A
Ease of Use ..... A
Documentation ..... A+
Value ..... A+
Final Grade ..... A

Cost: Freeware ($15 suggested)
Manufacturer: RAG Software, 1032 Chantenay Dr., Gloucester, Ontario, Canada K1C 2K9
Requirements: Console, TV or monitor, memory expansion, disk system and TI-Writer, Editor/Assembler or Extended BASIC. Printer optional.

The macro facility: Some operations are common in assembly language programs: accepting data from the keyboard, displaying text to the screen and file I/O. With the TI Editor/Assembler, these functions are often tediously coded (and debugged) for each applications program. The macro facility provides a shorthand way of coding common operations with a single macro statement.

The best way to get a sense of what the Macro Assembler is all about is to consider an example. The program shown in Listing 1 allows fast review of DIS/VAR 80 files. It operates in text mode and uses a 14-row window at the top of the screen to scroll the contents of files. A five-row window at the bottom of the screen is used to input successive file names. These two windows are scrolled separately. The program includes error handling and FCTN-BACK return to the master title screen. The source for such a program might be expected to take up the remainder of this issue. However, the Macro Assembler version requires only 86 lines.

Macros can reference external routines, and two support subprograms are provided. RAGIO is referenced by the file I/O macros and RAGDIS by the screen display macros. When reference is made to either RAGIO or RAGDIS, that file must be loaded prior to program execution. The source code is provided and may be assembled with the applications program. Six routines in RAGIO and RAGDIS are referenced by the macros in the scroll program.

The Screen Control Block is used for PRINT and INPUT. An SCB defines the VDP addresses of the top and bottom lines of the window, the length of a screen line and whether the display is in text mode (TE). SP gives a scroll before a PRINT, and ML gives multi-line output if data exceed the length of one line. If a screen control block is to be used for INPUT, the INP parameter is required to specify the starting VDP address of the data. Other parameters which can be used with the SCB include: SO—specify screen output; PR—INPUT prompted by a number sign; SI—scroll before INPUT; SC—scroll before both INPUT and PRINT; and RM—return on maximum INPUT length without ENTER being pressed.

The Data Control Block is used with OPEN, CLOSE, GET and PUT for file I/O. The DCB specifies where the PAB is to be located in VDP RAM, and what label to branch to when an end-of-the-file is encountered or when a file error occurs.

The Peripheral Access Block macro assembles a PAB. The parameters may be entered in any order. In this case the file is VAriable, DIsplay, SEquential, INPut and has a Record Length of 80. The record BUffer is to be placed at 1000 in VDP RAM and a dummy file name is specified.

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TI99/4A MACRO ASSEMBLER—

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Starting at SCROLL, the first several lines of the program put the display in text mode and set the foreground to white and background to blue. The SETV macro is used to transfer values to VDPWA. In this case, the highest bit of the operand value is a 1, indicating that a value is to be written to a VDP register. The next nybble contains the register number, and the least significant byte the value to be written.

At NEXT, the PRINT and INPUT work like a DISPLAY AT and ACCEPT AT in Extended BASIC. The SCB for WIND2 was set up to scroll prior to a PRINT but not prior to an INPUT. The INPUT allows for a maximum input length of 12 characters. If FCTN-BACK is pressed, the program will branch to the label QUIT.

When the file name has been entered, it must be transferred from VDP RAM to the PAB data in CPU RAM (PDATA). The next several lines of ordinary source code do that and also count the length of the device and file name. Prior to the transfer, the MOVBL—a byte block move—initializes the previous file name with 10 space characters.

The file is opened with a simple OPEN statement. Records are read with a GET and scrolled to the upper window with a PRINT.

The READ loop is terminated upon end-of-file or a file error as specified in the DCB. When either condition occurs, the file is closed and control transfers back to the input prompt. File errors automatically generate an error message. The QUIT routine returns to the Master Title Screen in the event FCTN-BACK is pressed at INPUT.

Writing new macros: The package comes with a well-documented library of macros. In addition to those used in the illustration, the following are available: BE, BNE, IF, IFB, BEEP, HONK, PUT and PABEQU. No library would be perfect for all applications, however, and one of the best features of the package is that it allows the user to write new macros and modify the macro library. A set of assembler directives is provided for this purpose.

When developing a new macro, the definition should be assembled with the applications program until the macro is working properly. Then the macro definition can be transferred to the macro library. The macro library is in DIS/VAR 80 format, and the macro source code is simply entered in the library file.

As an example, consider a macro version of CALL KEY using the following format:

[label] KEY gas,gad,gad

The key-unit is specified in the most significant byte (MSB) of the first parameter. The ASCII code of the key pressed is returned in the MSB of the second parameter and the key-unit status (-1, 0 or 1) is returned in the third parameter as a word value. The macro ends by comparing the key-unit status with 0, allowing immediate testing of the status register.

Listing 2 gives a macro definition for KEY. When the KEY macro is encountered, the assembler uses the macro definition to generate the source code shown in Listing 3. Macro definitions utilize macro directives which begin with a $ in column one. The $MACRO and $END directives show the beginning and end of a definition. Macro directives not used in the example include $GOTO, $IF, $LABEL, $EXIT, $ERROR and $REM.

Macro definitions also make use of special macro symbols. These begin with an &. There are four types of symbols: parameter (P), local (L), global (G) and system (S). There are 10 of each type numbered from 0 to 9 for a total of 40 symbols (&P0-&P9, &L0-&L9, etc.). The value of each symbol is a string from 0 to 40 characters long.

The &P symbols are used to refer to the parameters in the source statement the macro defines. The &P0 symbol is the label and &P1 to &P9 reference the nine possible parameters a macro statement may have. In the example, there are three parameters—&P1 to &P3.

Substring notation can be used with symbols. The number before the decimal indicates the starting character and the number after the decimal the length. If &L0 is @RAGSMK, then &L0(2.6) is RAGSMK.

In studying the relationship between Listing 2 and 3, remember that the function of the macro definition is to generate source code. Macro definitions may be thought of as programs that write source code.

Macros can have external references, and this one references RAGSCN. RAGSCN is a version of KSCAN that was added to the RAGDIS support file.

Once the KEY macro has been defined it can be added to the macro library. The following could be inserted in Listing 1 to temporarily halt the scrolling of a file when a key is pressed:

```
CLR @R3
CHKHLT KEY R3,R4,R5
BE @CHKHLT
```

Other improvements: Beyond the macro facility, the package provides other welcome improvements over the TI assembler. The user has more control over the assembler listing with the expanded set of options provided. Character strings may be permanently imbedded in the assembler to set up the printer as desired for listings. Following a listing, the printer may be returned to its normal mode.

The error diagnostics have also been improved dramatically. When editing for errors, the user will know exactly what to look for and where to find it. In addition to a good description of the error, the assembler gives the line number of the source statement within a source file. This eliminates the problem of locating a bad statement when the COPY directive is used.

Availability: Users group representatives may obtain a copy of the package directly from Green for $15. The disks may then be copied for group members and others. This software is an important new resource for all TI users involved in assembly language.

Newsbytes

Asgard releases PRE-SCAN IT!

PRE-SCAN IT! by Asgard Software was scheduled for release July 15.

PRE-SCAN IT! is a utility which is said to scan Extended BASIC programs line by line, rewriting them so that they will run immediately.

The program sells for $10 and requires TI Extended BASIC and a disk system.

For further information or to order, contact Asgard Software, P.O. Box 10306, Rockville, MD 20850.

After Hours BBS runs in assembly

Ed Schaum of the Bronx, New York, announces the After Hours BBS, running on a TI99/4A.

Schaum says he wrote the BBS in "100 percent assembly language. Because it is assembly language, this BBS is faster than any BBS now in operation on any home computer."

The BBS operates at 300 and 1200 baud, 24 hours, seven days a week. He says the BBS has more than 1.4 megabytes of online storage and features uploads and downloads using XMODEM. Schaum says After Hours currently contains 10 message bases, including personal ads and an "adults-only" message base, and "can be expanded to include any number of message bases."

For more information, he says, call the board at (212) 547-4210 "and yell for a chat."

ProtoCall to open interactive gaming

ProtoCall, the entertainment-oriented telecommunications service of Interplay, Inc., is approaching its final phase of online construction, according to Dennis Flanders, Interplay's chief executive officer.

He said the service's interactive gaming area was scheduled to open this summer with several types of role-playing adventures.

The service offeres a choice of special interest groups (SIGs) and user-formed clubs. No TI SIG is operating on the service at present.

According to Susan Zelinski of the service, ProtoCall has not received any letters of proposal for a TI SIG. She says the service does not seek to install particular types of SIGs, but considers proposals submitted by users.

ProtoCall may be reached by telephone from more than 600 U.S. cities without long-distance charges. Connect-time fees for evenings, weekends and most holidays are billed at $3.60 an hour for access at 300 baud, $4.80 an hour at 1200 baud. Commercial access (Monday through Friday, 7 a.m to 6 p.m.) is billed at $12 an hour at 300 baud, $15 an hour at 1200 baud.

For further information, call toll-free at 1-800-826-3286 or write Interplay Inc., 10875 Main St., Suite 210, Fairfax, VA 22030.

Mid-Hudson 99ers meet monthly

The Mid-Hudson 99ers of Newburgh, New York, meet from 6 to 8 p.m. the first Saturday of each month at Bldg. 710, Stewart Airport, behind the New Windsor Police Building.

For further information, write Mid-Hudson 99ers, P.O. Box 7298, Newburgh, NY 12550 or call (914) 561-2985, 562-4226 or 561-0564.

Ryte Data licensed for card manufacture

Ryte Data/Millennium of Haliburton, Ontario, Canada, has received license to manufacture the 80-column display unit distributed by Mechatronic of West Germany.

According to Bruce Ryan of Ryte Data, the designer was contracted directly to supply all necessary schematics and technical information to commence production in August.

Ryan says plans call for the unit to contain 192K of video RAM using the 9938 video chip, 256 x 208 resolution, 256 colors in 80-column mode, choice of 16 colors from a 512-color pallette in 4A mode, EPROM-based software, RGB or composite monitor output, full software compatibility, access from BASIC, Extended BASIC or Assembly language and compatibility with console-only or expanded systems. The only equipment required is a console and a high-resolution monitor.

Ryan says price is expected to be under $200 U.S. The unit will plug into the console with a cable that clips onto the 9918A video chip on the motherboard.

He notes that Ryte Data is considering an internal module to install inside the console, or a unit with a flex cable connector to the rear or a unit to sit on the console and requests comments from users on this project.

He also says that Ryte Data is "looking to market" products from Altronic of West Germany, which has a line of 16 different products for the TI99/4A.

These products include a one-megabyte RAM expansion which functions as a RAMdisk and the user addresses the memory. It includes a supervisor program which is a memory management program that monitors banks within the RAMdisk. The supervisor program is compatible with BASIC, Extended BASIC and assembly language.

Another product is a double-sided, double-density disk drive controller that includes 32K memory expansion on the same card.

Also from Altronic is an RS232 with two serial ports and one parallel port, with 32K memory expansion on the same card.

A complete expansion with 32K, RS232, DS/DD disk controller for four drives which can hold two DS/DD drives all in the same case is an Altronic product. Ryan says the whole

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Newsbytes

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package, including two drives, is approximately 5 inches high, 6½ inches wide and 13 inches deep. He says it does not require an external disk drive cabinet and power supply.

For further information, contact Ryte Data at 210 Mountain St., Haliburton, Ontario, Canada K0M 1S0 or call (705) 457-2774.

South Jersey users group forms

The South Jersey Texas Instruments Computer Club was formed in March.

The club's president, Bill Schwoer, operates a TIBBS board, the SHORELINE from 9 a.m. to midnight daily at 300 baud. Number is (609) 652-1965.

Mark Olanoff, the group's secretary, says the club is interested in exchanging newsletters with other TI users groups. For further information, contact the club at P.O. Box 902, Mays Landing, NJ 08330.

TI-LINE BBS offers 300/1200 baud

The TI-LINE BBS is operating at 300/1200 baud and can be accessed at (215) 926-1661 24 hours a day, according to Pete Baney of Leesport, Pennsylvania.

He says the system consists of four physical drives plus one RAMdisk. Primary objective is up/downloading of legally available programs and information, he says.

He says the system is an extended version of the original TI-LINE of Reading, Pennsylvania, and the original Users File has been retained.

Drive four is reserved for downloading only, he says. He notes that a different program will be featured each week.

RumOR RaG BBS

RumOR RaG BBS operates at 300 and 1200 baud at (206) 533-0951.

The 24-hour BBS is operated by Randall Ainsworth of Aberdeen, Washington, author of RAndY's RumOR RaG on The Source. His co-sysops are Garry Noel and Jeff Protheroe.

Ainsworth says the board features TE2 and XMODEM transfers, "an easy-to-use message base and a number of interesting info and news files."

Bostonians publish book on TI-Writer

The Boston Computer Society has issued a new publication, "TI-Writer Tips and Tricks."

Joyce Corker of the society compiled material for the 24-page book as well as writing new material for it.

The book sells for $5 per copy and is available from the Boston Computer Society, TI99/4A User Group, One Center Plaza, Boston, MA 02108.

TOD Editor changes

Asgard Software announces version 2.1 of TOD Editor, which incorporates changes suggested in the March MICROpendium review by Jonathan Zittrain, according to Chris Bobbitt, general manager of Asgard.

According to author John Behnke, the program already had the option to see and alter the monster graphics instead of creating them from scratch built into the supporting assembly language routines. Users can create the changes by entering the Extended BASIC environment and loading the program EDITOR off the working copy of TOD Editor, Bobbitt says. After the program is loaded, the user types in:

```
5271 IF @  THEN 5280
```

and

```
5272 IF S$="D" THEN CALL LINK("HS",B$(Z)) ELSE CALL LINK("HS",C$(Z))
```

The user should then re-save the program EDITOR, Bobbitt says.

He notes some copies of version 2.0 also contain an unannounced sample game called DARK-TOWER. Version 2.1 contains all revisions of 2.0 and the new coding and two sample games.

Users not wishing to make their own revisions or who want the new sample game may return their original to Asgard Software, P.O. Box 10306, Rockville MD 20850 with a check for $2.50 to cover duplicating and mailing.

Great Lakes Software issues new product

Great Lakes Software has recently completed JOY PAINT PAL, a companion product for JOY PAINT '99.

According to Ernest Chandler of Great Lakes Software, JOY PAINT PAL adds several capabilities to JOY PAINT '99, including the ability to use GRAPHX, TI-Artist and Draw-N-Plot screens.

Chandler says old screens from these programs can be loaded directly for use with JOY PAINT '99.

He says JOY PAINT PAL also includes a diskette full of character sets and clip art. JOY PAINT PAL retails for $9.95.

Readers of MICROpendium are also offered JOY PAINT '99, Great Lakes' graphics program, at the reduced price of $39.95, with Great Lakes' advertisement from the July issue.

For further information, or to order, contact Great Lakes Software, 804 E. Grand River Ave., Howell, MI 48843.

BRAIN price lowered

Price for Datax's new program, the BRAIN, has been lowered to $39.95, according to Julian Achim of Datax.

The BRAIN contains routines for converting numbers in four number base systems, tables for ASCII codes in both hex and decimal and tables of TMS 9900 instruction set. The program originally was priced at $49.95. (See June 1986 issue.)

For further information, or to order, contact Datax, 1923 Linden St., Ridgewood NY 11385 or (718) 417-0165.

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Newsbytes

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CHELSIE BBS runs in central Connecticut

Christine Dansro announces THE CHELSIE BBS in the central Connecticut area at (203) 665-0119.

Hours are 6 p.m.-6 a.m. Eastern Standard Time weekdays and 24 hours weekends. The board operates at 300 and 1200 baud.

Dansro says that the board has "an impressive public domain program collection," and that she plans to operate it 24 hours every day in the near future.

RAPID LOADER sells through 'Groupware'

Kazco International is producing RAPID LOADER, which is said to load Infocom games in 45 seconds with Extended BASIC and 35 seconds with Editor/Assembler.

According to Ray Kazmer, president of Kazco, this reduces wear on drives 75-85 percent.

He notes that RAPID LOADER offers 10 additional text and screen color combinations. He says because the program uses less disk space than the original laders, a single-sided, single-disk drive owner can now put up to three saved games onto the "converted" Infocom game disk and DSDD owners can save all five of the possible saved game positions.

Kazmer says that using TI-Artist, RAPID LOADER can print an exact duplicate of its own label.

He says the company is offering the program under a concept called "Groupware" in which a user group purchases the rights to make and sell copies of the program for a fee set by the author. The group is then authorized to make and sell copies of the disk to members only. Groups then keep all monies collected from their members.

Group price for RAPID LOADER is $35 ($40 outside the U.S.) for the 22-program disk; 15 programs will be personalized with the user group's name. Kazmer suggests a $5-7 resale price.

For further information, write Kazco International, P.O. Box 44023, Sylmar, CA 91342.

80 track option for disk controller

Lou Phillips of Myarc Inc. says the company offers an 80-track option for its disk controller card.

The modification for the card was made by Paul Charlton. Phillips says the option has been available for several months.

The upgrade option sells for $49.95. For further information, contact Myarc Inc., P.O. Box 140, Basking Ridge, NJ 07920 or (201) 766-1700.

Newsbytes is a column of general information for TI99/4A users. It includes product announcements and other items of interest. The publisher does not necessarily endorse products listed in this column. Vendors and others are encouraged to submit items for consideration. Items submitted will be verified by the staff before inclusion and edited to fit the Newsbytes format. Mail items to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

User Notes

Dvorak keyboard with GRAM Kracker

Randy Ainsworth, author of Randy's RuMoR RaG, which appears on The Source and in several user group newsletters, says TI users don't have to settle for a QWERTY keyboard. (QWERTY is the standard typewriter keyboard layout. The nickname comes from the first six keys on the second row of keys of a standard keyboard.) But we'll let him explain:

Back in the 1800s when the typewriter was invented several different keyboard layouts were used, but we have been stuck with the standard QWERTY layout.

The keys were arranged this way so that the most commonly used letters were more difficult to get to, therefore keeping the hammers of the typewriter from hitting each other.

Alternative keyboard layouts have been proposed from time to time, but it's like suggesting that we all learn to speak Esperanto.

In 1943, Dr. August Dvorak proposed the Dvorak layout and that is one version that gained some acceptance. Proponents of the Dvorak keyboard claim a significant increase in typing speed over the QWERTY layout.

Several computer companies support the layout indirectly. Apple has a hardware switch on the 2c and Wang offers the Dvorak as an option on some systems, as does Hewlett-Packard.

Using GRAM Kracker, it is possible to create any keyboard layout you want by just changing keycodes.

To make the change, start at GROM <1700 (leave the display in ASCII) and notice that there are six asterisks followed by a space and then =xws2 and more ASCII characters. This is where you will make the changes.

Start with the equal sign and type in:

```
=j.o2
91nzkpe38rtv
xyu47chwbfi5
6gdmq,a10/s{
+J>0@
(LNZKPE#*RTV
XYU$&CHWBFI%
^GDMQ<A!)?S}
```

Now jump down a few lines and replace the left brace (FCTN F) with a

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colon; replace the right brace (FCTN G) with a semicolon; and replace the question mark (FCTN I) with a hyphen.

Since the TI does not have a standard typewriter keyboard, I had to cheat a litle. The Dvorak layout you will have is shown below:

```
, . D Y F G C R L ? }
A O E U I D H T N S
Q J K X B M W V Z
```

The following keys have two functions:
FCTN F is a colon and FCTN G is a semicolon. Shift P is a right brace and lower "p" is a left brace.

The inspiration for this came from Barry Traver wishing he had a Dvorak keyboard, and Michael Ballmann gave me the technical information as to where the keycodes were.

Changing defaults in TI-Writer

Rick Cosmano, vice president of the Southern California Computer Group (S.C.C.G.) of San Diego, writes:

Using a sector editor program and a backup copy of the FORMA1 file (from TI-Writer), search of 02 00 07 F5. The F5 is the Hex code for the screen color. I changed mine to F0 for white on transparent. Next, search for 80 02 01 F5. The F5 in this case is the Hex code for the character color. Again, I changed mine to F0 for white on transparent.

For those who use a GRAM Kracker and have combined the Editor and Formatter using TIWGRAMDSK, load your TI-Writer into GRAM 0 and search for the above address. I found mine located at gB2A5 for the screen color and at gB2B4 for the character color.

Cosmano also notes that users may want to modify TI-Writer so that the ampersand and "at" signs can be used as regular text characters. (TI-Writer uses these symbols as control characters and requires that they be entered twice in order to have them displayed as text characters.) He continues:

Search the FORMA1 file for 23 21 40 26. Change the 40 26 to 60 5C. This will allow you to use the & and @ as regular text characters. The "tick" (FCTN C) is now used for overstrike and the backslash (FCTN Z) is used for underscore. My GRAM Kracker location was gA571. Search for the above Hex code in that location.

Housekeeping with QuiK-Vu

Erik Olson, of Colorado Springs, Colorado, writes:

Quik-Vu is an Extended BASIC program I have written to do "housekeeping" on files. It is basically a catalog program. It can catalog disk drives 1-4, any Winchester directory, or a RAM-disk that follows the same format as a disk. I prefer to place this program on the directory WDS1.DSK1.LOAD so that everytime I used Extended BASIC I can check how much space I have or see if anything needs deleting.

Options are selected by pressing the first letter of the command. At any time during the program you may enable a printer by pressing FCTN P. Hit it agan to disable the printer. CTRL C will abort any listing, and any other key will pause a listing. A second keypress restarts the display.

The first menu ask for (D)isk, (W)inchester or (O)ther. If you select Disk, the program will ask you to press a drive number from 1 to 4.

If you select Winchester, you must enter the directory, much in the same way that the Myarc Winchester utilities operate. The WDS is there for you, you must enter the unit number and any subdirectory names. You have two lines to type on; if you fill the first line press Enter and continue on the second. If you do not need the second line, just press Enter on it. (MICROpendium was unable to list subdirectories with this program. Nor were we able to list the contents of any hard disk directory, though we were able to list directory names—Ed.)

The Other command asks you to enter the entire devicename. Note that on all devicenames you type you may include the period at the end, which signals the catolog file (the program will add the period itself if necessary).

Once the program is through cataloging, another menu is displayed. Yur choices are (V)iew, (D)elete, (R)edo and (Q)uit. The View option prompts you for a filename on the device you just cataloged. If the file i a Dis/Var 80 or Dis/Fix 80 file it will be printed on the screen or printer. As in the catalog function, CTRL C will abort, FCTN P toggles the printer and any other key pauses.

The Delete function prompts for a filename on the device, asks if you are sure, and then deletes it. The Redo option restarts the program. Quit returns to Extended BASIC.

At any time, should be be an I/O error, it will be trapped and control will be transferred to the command menu.

```
10 REM ** QUIK-VU **
20 REM BY ERIK OLSON
30 P$="PIO"
40 DF$="D/FD/VI/FI/VPGMDIR"
50 DISPLAY AT(24,1)ERASE ALL
:"(D)ISK (W)INCHESTER (O)THE
R"
60 GOSUB 340 :: ON POS("WwOo
Dd",CHR$(ABS(K)),1)+1 GOTO 6
0,90,90,120,120,70,70
70 DISPLAY AT(24,1):"DRIVE N
UMBER 1-4"
80 GOSUB 340 :: IF K<49 OR K
>52 THEN 80 ELSE D$="DSK"&CH
R$(K)&"." :: GOTO 130
90 DISPLAY AT(22,1):"DIRECTO
RY NAME:":"WDS1.":""
100 ACCEPT AT(23,4)SIZE(-25)
:D$ :: ACCEPT AT(24,1)SIZE(-
28):A$ :: D$="WDS"&D$&A$ ::
IF SEG$(D$,LEN(D$),1)<>"." T
HEN D$=D$&"."
110 GOTO 130
120 DISPLAY AT(23,1):"DEVICE
```

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```
NAME?" :: ACCEPT AT(24,1):D$
 :: IF D$="" THEN 50 ELSE IF
 SEG$(D$,LEN(D$),1)<>"." THE
N D$=D$&"."
130 CALL CLEAR :: L=1 :: OPE
N #1:D$,INPUT ,INTERNAL,FIXE
D,RELATIVE
140 A$="SCANNING "&D$ :: GOS
UB 370 :: PRINT :"CTRL-C TO
STOP": : :: W=SEG$(D$,1,3)="
WDS" :: A$="-NAME----- --TYP
E--- SIZ PRO" :: GOSUB 370
150 GOSUB 340 :: IF K=131 TH
EN 210 ELSE IF S=1 THEN 190
ELSE INPUT #1,REC L:A$,A,C,B
 :: IF A$="" THEN 200
160 PRINT A$;TAB(12);SEG$(DF
$,ABS(A)*3-2,3);" ";STR$(B);
TAB(23);STR$(C);TAB(27);RPT$
("P",ABS(A<0))
170 IF P=1 THEN PRINT #2:A$;
TAB(12);SEG$(DF$,ABS(A)*3-2,
3);" ";STR$(B);TAB(23);STR$(
C);TAB(27);RPT$("P",ABS(A<0)
)
180 L=L+1 :: GOTO 150
190 GOSUB 380 :: GOTO 150
200 IF W=1 AND L<115 THEN L=
115 :: GOTO 150
210 A$="" :: GOSUB 370 :: CL
OSE #1
220 ON ERROR 290 :: PRINT :
:: DISPLAY AT(24,1)BEEP:"(V)
IEW (D)EL (Q)UIT (R)EDO"230
GOSUB 340 :: ON POS("DdVvRrQ
q",CHR$(ABS(K)),1)+1 GOTO 23
0,320,320,250,250,50,50,240
240 END
250 INPUT "FILENAME:":A$ ::
OPEN #1:D$&A$,INPUT ,VARIABL
E 80 :: GOTO 270
260 ON ERROR 290 :: OPEN #1:
D$&A$,INPUT ,FIXED 80
270 LINPUT #1:A$ :: IF EOF(1
)THEN 210 ELSE GOSUB 370 ::
GOSUB 340 :: IF S<1 THEN 270
280 IF K=131 THEN 210 ELSE G
OSUB 380 :: IF K=131 THEN 21
0 ELSE 270
290 CALL ERR(A,B,C,D):: IF A
=130 THEN RETURN 300 ELSE PR
INT "ERROR";A;"IN LINE";D ::
 END
300 PRINT :: IF D=130 THEN 2
60 ELSE DISPLAY AT(23,1)BEEP
:"I/O ERROR" :: ON ERROR 310
 :: CLOSE #1 :: GOTO 220
310 RETURN 220
320 DISPLAY AT(24,1):"DELETE
 FILENAME:" :: ACCEPT AT(24,
17)SIZE(10):A$ :: DISPLAY AT
(24,1)BEEP:"DELETE "&A$&" (Y
/N)"
330 GOSUB 340 :: IF K=78 OR
K=110 THEN 220 ELSE IF K=89
OR K=121 THEN DELETE D$&A$ :
: PRINT "DELETED "&A$ :: GOT
O 220 ELSE 330
340 CALL KEY(5,K,S):: IF K<>
34 THEN RETURN ELSE IF S=1 T
HEN P=ABS(P-1):: DISPLAY AT(
1,1):"":"PRINTER IS "&SEG$("
OFFON",P*3+1,3):"" ELSE 360
350 IF P=1 THEN OPEN #2:P$,O
UTPUT ELSE CLOSE #2
360 S,K=0 :: RETURN
370 PRINT A$ :: IF P=0 THEN
RETURN ELSE PRINT #2:A$ :: R
ETURN
380 GOSUB 340 :: IF S<1 THEN
 380 ELSE RETURN
```

Converting other BASICs

The Chicago TImes, the newsletter of the Chicago TI99/4A User Group, recently carried an item by Rich Klein concerning the use of the DEFine statement. DEF is a handy tool that allows users to define their own functions in using BASIC and Extended BASIC. While this has many applications, Klein offered illustrations in which the DEF was used to define PI in one case, and to create LEFT$, MID$ and RIGHT$, commands that are common to many versions of BASIC but not TI BASIC.

Here's how DEF may be used to define PI:

```
100 DEF PI=3.141592654
```

Any time the program uses the PI function it would be evaluated as defined above.

Similarly, the DEF can be used to define LEFT$, MID$ and RIGHT$. Here's an example:

```
100 DEF LEFT$(X$,Y)=SEG$(X$,1,
Y)
110 DEF MID$(X$,Y,Z)=SEG$(X$,Y
,Z)
120 DEF (RIGHT$(X$,Y)=SEG$(X$,
LEN(X$)-Y-1,Y)
```

TI-BASIC uses SEG$ to locate string data from left to right, while LEFT$, MID$ and RIGHT$ are used to locate string data from left to right; from a predefined position that may be anywhere in the string; and from right to left, respectively.

MMM tips improve assembly operations

Merle Vogt of Von Ormy, Texas, writes:

I have been doing some excavating in the Line by Line Assembler that goes with Mini-Memory. If you have an expansion memory, you can improve assembly operations quite a bit by pulling the Label Table and the machine code areas out of Mini-Memory and into expansion RAM, using Easy Bug. Here's how:

1. Relocate machine code. Look at Addr 722E; change default load address, now 7D00, to someplace in expansion RAM, like 2100.

2. Relocate Symbol Table
   A. At 7780, change 7CD6 to 2CD6
   B. At 77E6, change 7CD8 to 2CD8
   C. At 782C, change 7CD4 to 2CD4
   D. At 77CC, change 7CD6 to 2CD6

Some other information about Line-by-Line:

7118-71A4—Data items, save areas, work spaces.
71A6-7924—Instruction code.
7926-79C0—Data and messages.
79C2-79D8—Instructions, BLWP links.
79DA-7BA8—Instruction code.
7BAA-7CD6—Data area.

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Program lists disk contents

The following program, by Bill Gaskill of Grand Junction, Colorado, is short and to the point. The Extended BASIC program displays only the program and filenames of a disk. The names are listed in two columns. Its advantage over most catalog programs is its speed. It doesn't work like lightning, but it doesn't waste a lot of time pulling up information about files you may not need, such as file type and length and protection status. Included at the top of the listing are the diskname, and the number of used and unused sectors. As published below, it searches only DSK1. Gaskill suggests saving it under the name LOAD. "You will be able to see what's on any disk in a matter of seconds," he notes.

```
1 @=1 :: OPEN #@:"DSK1.",INP
UT ,RELATIVE,INTERNAL :: INP
UT #@:F$,E,E,F :: DISPLAY AT
(2,@)ERASE ALL:F$:"FREE=";F;
"USED=";E-F :: R=5 :: C=@
2 FOR H=@ TO 127 :: INPUT #@
:F$,D,E,F :: DISPLAY AT(R,C)
:F$ :: R=R+@ :: IF ABS(D)=0
THEN CLOSE #@ :: END
3 IF R<24 THEN 4 :: C=16 ::
R=5
4 NEXT H
```

Label-Typer bugs worked out

Several readers have pointed out a small bug in last month's Label-Typer program. One, line 110 should refer to line 220, not 130. And, two, users should add this line:

185 IF A$="Q" OR A$="q" THEN 210 ELSE 220

Too long? This may help

There comes a time when a BASIC program is too big to be loaded into memory. Often this occurs when transferring a program from cassette to diskette. Anyone who has encountered the dreaded Memory Full error knows full well what we're talking about. There are many ways to deal with this, some work and some don't, but this advice is for those with the Mini-Memory cartridge.

Select BASIC from the MMM menu and enter CALL INIT. This will clear the MMM RAM. Load the program from disk. Then enter SAVE EXPMEM2. This moves the program into the expansion memory. Next, disable the disk drive with CALL LOAD(-31888,63,255). Then enter NEW. This doesn't erase the program since BASIC doesn't recognize expansion memory where it is stored.

Now enter OLD EXPMEM2. This loads the program back into RAM. Type RUN. The program should not execute without resulting in a memory full error.

Put a slash in that zero

Here's a program by Dane Heatherington of the Los Angeles 99ers Computer Group that is designed to place a better looking slash through the zero using Gemini printers. The program can be adapted for use by other printers that permit downloading of characters.

Actually, this program includes two versions in one. One version is for use with expansion memory and one is for use without extra memory. Running this program prior to using a printer will redefine the zero character. The expansion memory version redefines the zero and then returns to the Extended BASIC startup screen. This is done because the program is used simply to set up the printer zero character for use by other programs. As long as the printer remains on, the redefined zero will remain. The program, listed below, was printed using a Gemini after redefining the zero.

```
50 REM WRITTEN BY DANE R. HE
ATHERINGTON
60 REM FOR SYSTEM WITHOUT 32
K MEMORY USES ONLY LINES 110
-140
70 REM FOR 32K, ADD LINE 100
 ON BREAK NEXT :: CALL CLEAR
 :: CALL INIT
110 OPEN #1:"PIO"
120 PRINT #1:CHR$(27);CHR$(4
2);CHR$(0)
130 PRINT #1:CHR$(27);CHR$(4
2);CHR$(1);CHR$(48);CHR$(0);
CHR$(92);CHR$(34);CHR$(0);CH
R$(81);CHR$(8);CHR$(69);CHR$
(0);CHR$(34);CHR$(29)
140 PRINT #1:CHR$(27);CHR$(3
6);CHR$(1)
150 CLOSE #1 :: CALL PEEK(2,
A,B):: CALL LOAD(-31804,A,B)
```

User Notes is a column of tips and ideas designed to help readers put their home computers to better use. The information provided here comes from many sources, including TI home computer user group newsletters. MICROpendium will pay $10 for any item sent in by readers that appears in this column. Mail tips to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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